

Montgomery County, Maryland
Resource Conservation Plans

Fiscal Year 2006

(July 1, 2005 – June 30, 2006)



In Support of
Energy Management Capital Projects and
Utility Operating Budgets

Prepared by the Member Agencies of the

**Interagency Committee on
Energy and Utilities Management
(ICEUM)**

January 2005

Resource Conservation Plans - FY 06

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INTRODUCTION

This document provides the Resource Conservation Plans submitted by members of the Interagency Committee on Energy and Utilities Management (ICEUM), as required under Chapter 18A-9(d)(2) of the Montgomery County Code, in support of the FY 06 Energy Conservation Capital Improvement Projects and Utility Operating Budgets.

The Interagency Committee on Energy and Utilities Management (ICEUM) is responsible for coordinating County government energy conservation efforts, promoting energy efficiency, sharing information among agencies, providing technical assistance, and cooperating on the planning and implementation of energy conservation measures. The County Code lists the specific duties of ICEUM as follows:

1. Establish uniform utility unit costs for county operating budget proposes;
2. Prepare agency Resource Conservation Plans annually, describing current and anticipated energy conservation programs with actual and projected energy and cost savings; and
3. Advise the County Executive and County Council on energy conservation goals, cost savings, and new technologies.

The plans contained in this document are prepared in accordance with item number 2, above. As in previous years, ICEUM members describe their energy management goals and objectives, and provide information on the performance of some of the efforts undertaken in previous years.

This document includes introductory materials and a description of utility rate projections prepared by the Department of Environmental Protection.

The Department of Environmental Protection, Department of Public Works and Transportation's (DPWT) Division of Fleet Management Services, and the Office of Management and Budget (OMB) do not have Energy Conservation Capital Improvement Projects or Utility Operating Budgets. These agencies provide information, technical support, and energy planning services to ICEUM.

ICEUM Members

Agency	Primary Author of Resource Conservation Plan	Other Members
County Government - Facilities	Victor Sousa DPWT Division of Operations	Stephen Nash Division of Operations, DPWT
County Government – Vehicle Fleet		Sharon Subadan, Chief & Aubrey Bentham Division of Fleet Management Services, DPWT
County Government – Environmental Protection		Ann Elsen ICEUM Chair
County Government – Management and Budget		Bryan Hunt Office of Management and Budget
County Council		Chuck Sherer Council Staff
Montgomery County Public Schools	Ron Balon Energy Manager Facilities Management	Sean Gallagher , Assistant Director, Facilities Management Jeffrey Price Utility Analyst Anja Caldwell & Karen Anderson Green Schools Program
Washington Suburban Sanitary Commission	Rob Taylor Energy Manager	
Montgomery College	Michael Whitcomb Office of Facilities	Edward Boone Consultant
Maryland National Capital Park and Planning Commission	Richard Anderson Consultant	Stacey Spillane

UTILITY RATES

The County Code charges ICEUM with the establishment of uniform utility unit costs for county operating budget proposes. To that end, ICEUM members develop utility rate projections each year. In order to utilize a consistent methodology for projecting energy costs, ICEUM members review trends in futures markets for energy commodities. Futures markets are also considered in projections of motor vehicle fuel costs; however, final rate projections are set based upon predictions of DPWT's Division of Fleet Management Services as to contractual costs for vehicle fuels.

ICEUM rates are intended as "caps" which individual agencies do not exceed in developing their budgets. Since each agency purchases different volumes and types of fuels (such as usage vs. demand for electricity) each agency sets its own budget rates for utilities, under the established ICEUM cap. This year, ICEUM has seen significant increases across the board in utility unit costs. A number of factors affect these rate increases, as discussed in the following sections.

Electricity Deregulation

Deregulation of the electricity and natural gas industries continues to affect all agencies. In July 2000, the competitive marketplace for electricity opened in Maryland. Through the Electricity Deregulation Task Force, ICEUM members participated in the County's aggregated cooperative competitive procurement of electricity. The buying group for this procurement consists of all ICEUM member agencies with electricity budgets. In addition, eleven municipalities have chosen to participate in the joint purchase of electricity, and have authorized the buying group to make certain electricity procurement decisions on their behalf.

The lead agency in the electricity buying group is DPWT. With the help of a consultant, DPWT's Division of Operations has developed a streamlined, automated approach to electricity procurement which greatly enhances the ability of the buying group to respond quickly to changes in market conditions. Also, with the assistance of the Office of the County Attorney, and with the approval of the County Council, new procurement regulations have been developed to facilitate competitiveness in electricity procurements.

Joint procurement of electricity has resulted in total savings of over 5.4 million dollars for participating agencies and municipalities during the first four years of electricity deregulation. The Montgomery County buying group is the only government entity in the region to have achieved this level of cost savings through electricity procurement.

The following is a brief summary of aggregate savings achieved through the contracts with Washington Gas Energy Services and with Pepco Energy Services. The savings amounts are based upon the difference between the contracted cost of electricity and the cost of "default" power, or Standard Offer Service.

<u>Savings Amount</u>	<u>Time Period</u>	
\$ 2.2 million	12/1/00 - 5/31/02	(eighteen months)
\$ 1.6 million	6/1/02 - 5/31/03	(twelve months)
> \$ 1.6 million	6/1/03 - 6/30/04	(thirteen months)
<hr/>		
> \$ 5.4 million = Total Savings		

In addition to the savings listed above, ICEUM member agencies received credits in FY 01 and FY 02 as a result of Pepco's divestiture of generating assets. Also, in November 2001 the level of Pepco's "generation procurement credit" was raised significantly, producing additional cost savings. The "generation procurement credit" is an amount that Pepco refunds to distribution customers if Pepco is able to purchase power at a cost lower than the rate it charges for Standard Offer Service (SOS).

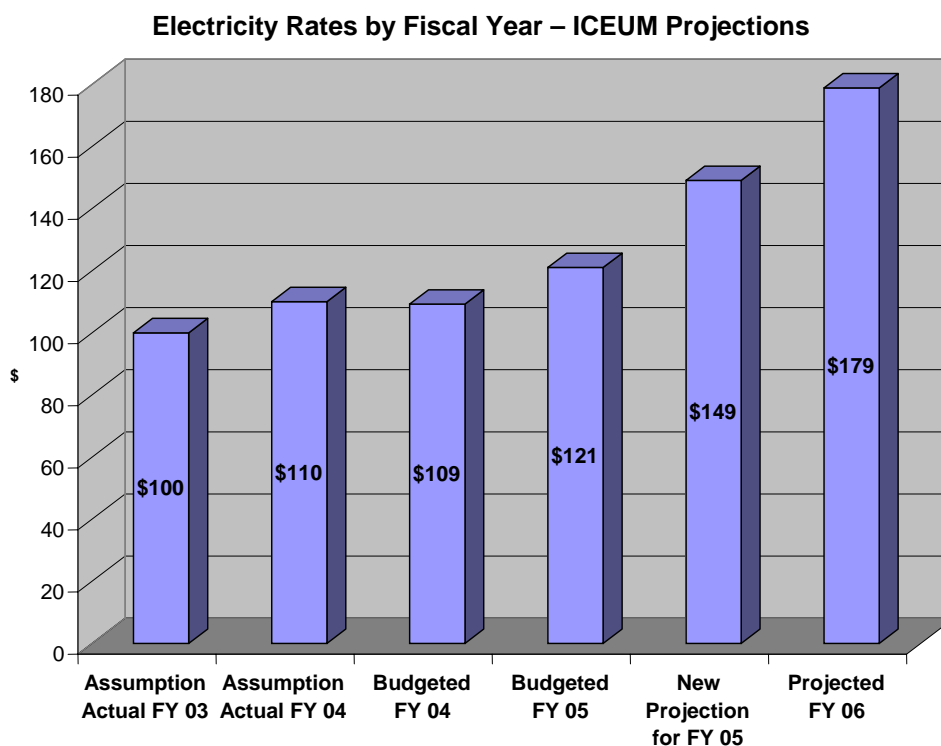
Electricity Rate Increases

A number of factors affect the increase in electricity rates, among which are:

- Expiration of price caps on Standard Offer Service (SOS)
- End of Pepco divestiture credits
- Reduction in generation procurement credits
- Increase in Montgomery County fuel energy tax rates
- Mandated purchase of clean renewable energy

The high level of success in purchasing electricity in the past might have set unreasonable expectations for the current fiscal year. Market prices for electricity are well above the prices the buying group received in earlier competitive procurements. While the group continues to realize savings via the joint purchase, regulatory changes and market conditions have not been favorable to the level of savings achieved in previous years.

Below is a visual representation of the electricity rates developed by ICEUM. The graph shows the relative increases since FY 03, using a unit of \$100 in electricity costs at the FY 03 beginning point. It assumes the Actual FY 04 rate to be close to the budgeted amount.



A portion of the rate increases shown in the graph above are the result of the County's purchase of wind energy. Costs of wind power per participant are shown in the table below.

Clean Renewable Power			
Agency	Yearly kWh wind power	Cost / year Wind only	Total kWh/yr Consumption
Housing Opportunities Commission	1,226,649	\$18,375.20	24,532,980
Montgomery College	1,286,259	\$19,268.16	25,725,180
Montgomery County Government	7,397,796	\$110,818.98	147,955,920
Montgomery County Public Schools	9,818,022	\$147,073.97	196,360,440
MNCPPC (bi-county)	2,542,190	\$38,082.01	50,843,800
WSSC (bi-county)	10,500,000	\$157,290.00	210,000,000
Chevy Chase Village	14,344	\$214.87	286,880
Chevy Chase Sect. 5	1,979	\$29.65	39,580
City of Rockville	760,272	\$11,388.87	15,205,440
College Park	74,041	\$1,109.13	1,480,820
Gaithersburg	351,349	\$5,263.21	7,026,980
Glen Echo	4,088	\$61.24	81,760
Prince George's County Gov.	4,270,276	\$63,968.73	85,405,520
Rockville Housing Authority	51,411	\$770.14	1,028,220
Somerset	8,753	\$131.12	175,060
Takoma Park	83,490	\$1,250.68	1,669,800
Town of Kensington	19,114	\$286.33	382,280
Town of Laytonsville	1,747	\$26.17	34,940
Total	38,411,780.00	\$575,408.46	768,235,600

Water & Sewer Rate Increases

In addition to a general increase in water and sewer rates, the adoption of the "Flush Tax," HB 555/SB 320, also affected agency budgets. Below is a summary of the annual tax amount per agency. The amounts are based on consumption data for FY 02, with assumptions of 5% annual consumption increases.

Agency	Cost per year
Montgomery College	\$ 10,183
Montgomery County Public Schools	\$ 258,203
DPWT	\$ 59,638
MD National Capital Park & Planning Commission	\$ 22,363
Recreation	\$ 8,863
Total for Fiscal Year 2002	\$ 359,250
Total for Fiscal Year 2003	\$ 377,212
Total for Fiscal Year 2004	\$ 396,073
Total for Fiscal Year 2005	\$ 415,877

In order to illustrate the effects of multiple factors on utility rates, Ed Boone, consultant to Montgomery College, prepared a detailed description of cost changes by fiscal year, using Montgomery College as an example. That example is shown on the following two pages of this

report.

MONTGOMERY COUNTY

Factors affecting utility rates

1/8/05

In Fy05 and Fy06 the following factors all negatively affected utility rates for ICEUM agencies.

- *County energy taxes
- *County mandated 5% of usage supplied by windpower
- *Pepco GPC (generation procurement credit)
- *Electricity Accounts supplied by third party suppliers
- *WSSC Flush tax
- *Utility rates

*County Energy Taxes

Electricity

Using College = 30,800,000 kwh

Prior to 7/1/03		\$.0028182 per kwh	\$ 86,800
7/1/03-6/30/04	Fy04	.0084569 +300% increase	\$260,473
7/1/04-6/30/05	Fy05/Fy06	.0128672 + 52% increase	\$396,300

Natural Gas

Using College = 624,000 therms

Prior to 7/1/03		\$.02542 per therm	\$15,900
7/1/03-6/30/04	Fy04	.0762961 +300% increase	\$47,600
7/1/04-6/30/05	Fy05/Fy06	.1160845 + 52% increase	\$72,400

Propane

Using College = 3,500 gallons

Prior to 7/1/03		\$.022811 per gallon	\$ 79
7/1/03-6/30/04	Fy04	.068433 +300 % increase	\$240
7/1/04-6/30/05	Fy05/Fy06	.1041208 + 52 % increase	\$364

Oil

Using College = 41,000 gallons

Prior to 7/1/03		\$.0352992 per gallon	\$1,417
7/1/03-6/30/04	Fy04	.105897 + 300 % increase	\$4,340
7/1/04-6/30/05	Fy05/Fy06	.16112228 + 52 % increase	\$6,606

***County mandated 5% of usage supplied by windpower**

Fy04		none
Fy05/Fy06	For College = 1,286,259 kwh	\$19,268

***Pepco GPC (a credit)** Using College = 30,800,000kwh

11/1/01-10/31/02	\$.0000135 per kwh	(\$ 416)
11/1/02-10/31/03	.0024002	(\$73,900)
11/1/03-10/31/04	.0016691 -30% decrease	(\$51,400)
11/1/04-10/31/05	.0001784 -90% decrease	(\$ 5,500)

***Electricity Accounts supplied by third party suppliers** College Savings

Fy01- all Pepco accounts for all agencies under contract for partial year	(\$2,200)
Fy02- all Pepco accounts for all agencies under contract for full year	\$137,736
Fy03- all Pepco accounts for all agencies under contract for full year	\$ 62,711
Fy04- all Pepco accounts for all agencies under contract for full year	\$ 44,962
Fy05/Fy06- only a handful of accounts for each agency under contract For partial years	\$ 4,163

***WSSC Flush tax**

Sliding scale based on number of equivalent units (residential customers)

Fy04	none
Fy05/Fy06	\$10,200

***Summary of above**

Fy05/Fy06 over Fy04	\$279,184
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Note: Fy05 differs slightly from Fy06 because quantities are
Slightly different

INTERAGENCY COMMITTEE ON ENERGY AND UTILITIES MANAGEMENT UTILITY RATES

September 28, 2004

FY05, FY06

Note: Unit cost or percentage change is a cap. Individual agency unit costs may be below the ICEUM established number, but can not exceed the projection. Energy cost projections for FY05 and FY05 assume the fuel energy tax at the level established in FY05.

	<u>BUDGETED FY04</u>	<u>BUDGETED FY05</u>	<u>NEW PROJECTED FY05</u>	<u>PROJECTED FY06</u>
Electricity	9.2 % increase over Actual FY 03	21% increase over Actual FY 03	35.5% increase over Actual FY 04	20% increase over Projected FY 05
Electricity rate projections include the price premium for wind energy and generation procurement credits. Electricity rate projections do not include divestiture credits.				
No. 2 Fuel Oil	\$ 0.84 per gallon	\$ 0.86 per gallon	\$ 1.57 per gallon	\$ 1.42 per gallon
Natural Gas	\$ 1.00 per therm	\$ 0.98 per therm	\$ 1.25 per therm	\$ 1.24 per therm
Motor Fuels: Note: Includes \$0.235 per gallon State tax.				
Unleaded	\$ 1.10 per gallon	\$ 1.35 per gallon	\$ 1.55 per gallon	\$ 1.45 per gallon
Note: Includes \$0.245 per gallon State tax.				
Diesel	\$ 1.05 per gallon	\$ 1.30 per gallon	\$ 1.41 per gallon	\$ 1.45 per gallon
Note: CNG rate excluded Federal excise taxes, which the County does not pay.				
CNG: (\$/gallon equivalent):				
Slow Fill	\$ 1.00 per g.e.	\$ 0.90 per g.e.	no longer used	no longer used
Fast Fill	\$ 1.25 per g.e.	\$ 1.49 per g.e.	\$ 1.26 per g.e.	\$ 1.30 per g.e.
Ethanol	\$ 1.45 per gallon	\$ 1.68 per gallon	\$ 1.91 per gallon	\$ 1.80 per gallon
Propane	\$ 1.00 per gallon	\$ 1.00 per gallon	\$ 1.26 per gallon	\$ 1.16 per gallon
Water & Sewer	0% increase over Actual FY 03	3% increase over Actual FY 03	3% increase over Actual FY 04	3% increase over Projected FY 05

SUMMARY – RESOURCE CONSERVATION PLANS

This section briefly summarizes the content of the agency Resources Conservation Plans, in aggregate, for all participating agencies.

Energy Management

The objective of an energy management program is to use engineering and economic principles to control the cost of energy needed to operate buildings and provide services. In order for energy management to be effective, it is first necessary for the energy manager to understand how much energy is being consumed and by what specific activities or equipment it is used. With this information, it becomes possible to identify opportunities for improvements in energy efficiency and to determine the amount of energy and money that can be saved by each measure. The energy manager may then compare the cost effectiveness of potential measures, and evaluate the effectiveness of measures that were implemented in the past. Each member of ICEUM currently has programs in place to provide energy management. However, programs differ widely among agencies, and the descriptions of energy management efforts presented in annual Resource Conservation Plans also differ widely in both content and format.

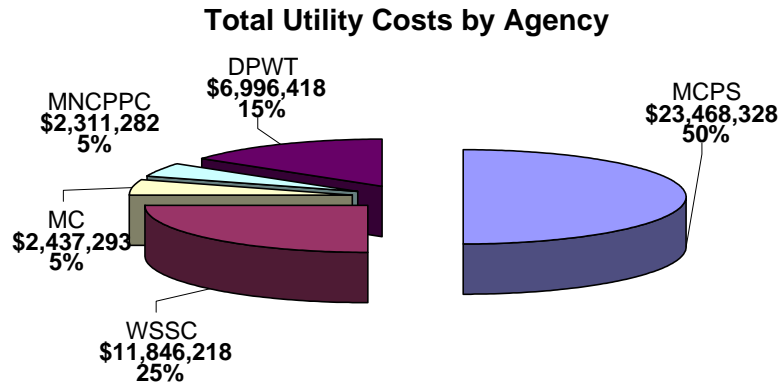
In order to provide some uniformity in the RCPs, summary forms were developed that contain the main components of energy planning. These forms are divided into sections on:

- general facilities characteristics,
- energy consumption information,
- existing energy management measures which are currently saving energy,
- new energy management measures implemented during the current fiscal year, and
- measures planned for implementation during future years.

Narrative material is also provided to supplement and explain the information in the summary forms.

Energy Costs

Utility costs fluctuate with rate changes and are influenced by a variety of external factors. The graph below shows the relative portion of the total energy budget for the County that is represented by costs for each agency, based on actual utility costs for FY 04.



Energy Savings

All ICEUM member agencies have been implementing energy efficiency measures as the primary component of their energy management programs. Individual measures that were implemented in the past, and estimates of the cost savings resulting from each measure are reported in the "Existing Measures" section of the summary forms of the Resource Conservation Plans. Measures that were implemented during the current year (FY 05) are listed as "New Measures." Energy saving measures planned for the coming fiscal year (FY 06) are listed as "Planned Measures." The initial costs of energy saving measures and annual energy cost savings for each agency are summarized in the table below:

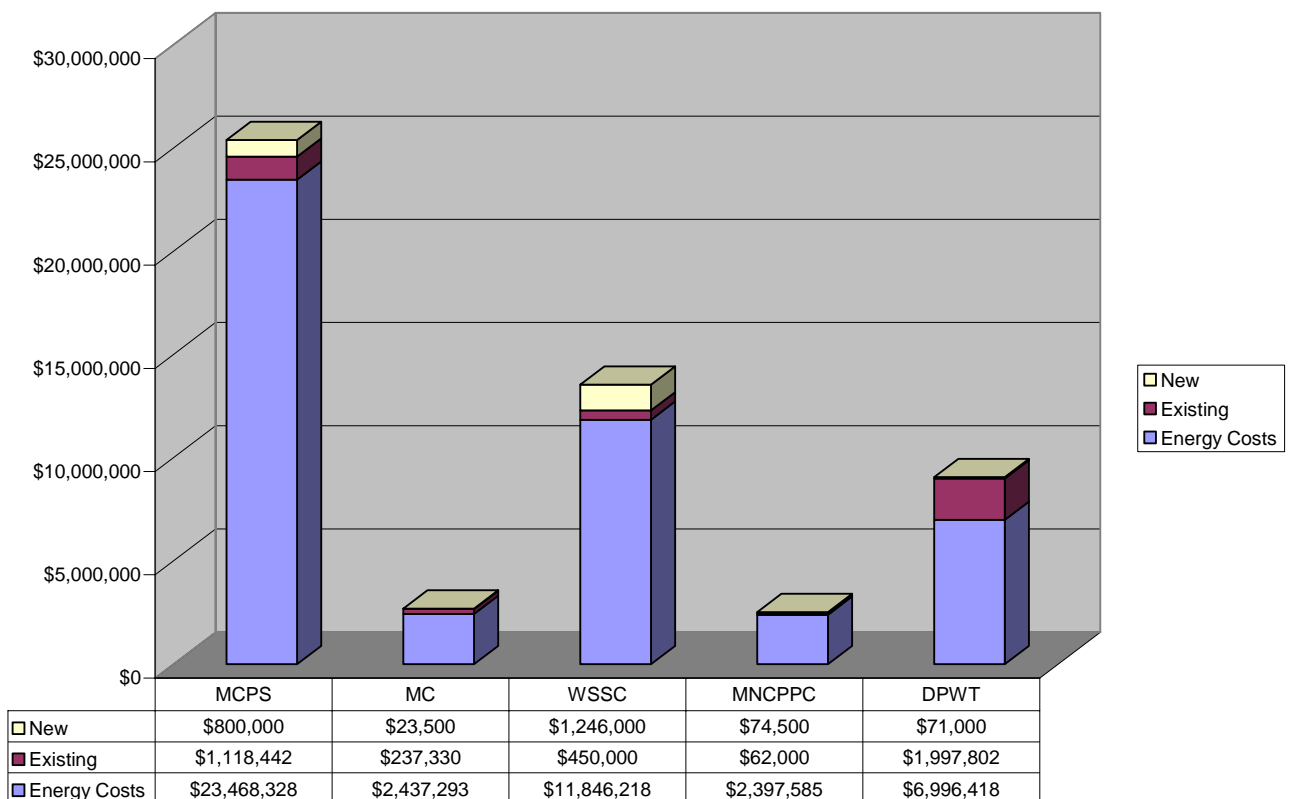
Energy Saving Measures by Agency	Investment Cost	Total Savings
Existing Measures		
MCPS	\$3,555,175	\$1,118,442
Mont. College	\$1,830,000	\$237,330
WSSC	\$250,000	\$450,000
MNCPPC	\$180,000	\$62,000
DPWT	\$11,106,363	\$1,997,802
total	\$16,921,538	\$3,865,574
New Measures		
MCPS	\$685,000	\$800,000
Mont. College	\$125,000	\$23,500
WSSC	\$1,289,000	\$1,246,000
MNCPPC	\$70,400	\$74,500
DPWT	\$1,045,000	\$71,000
total	\$3,214,400	\$2,215,000
Planned Measures		
MCPS	\$500,000	\$137,000
Mont. College	\$200,000	\$20,000
WSSC	\$9,000,000	\$2,660,000
MNCPPC	\$75,000	\$29,800
DPWT	\$1,025,000	\$71,000
total	\$10,800,000	\$2,917,800

Grand Total	\$30,935,938	\$8,998,374

Without the implementation of the energy saving measures summarized in the table above, the FY 06 aggregate utilities budget for all agencies would have been higher by a total amount of **\$6,080,574**.

This cost avoidance is shown visually on the graph below. Total energy costs are presented as a separate bar for each agency. The cost savings are shown as the top portions of each bar, with savings from “New” measures represented by the yellow area at the very top of the bar, and savings from “Existing Measures” shown as the red band just below that. The table below the graph provides actual dollar amounts of annual energy costs and energy cost savings.

Cost Avoidance from Energy Efficiency Measures



This graph shows the reductions in energy costs for each agency that have resulted from the implementation of “New Measures” and “Existing Measures.” These reductions represent avoided costs. The graph shows results only for those measures which are documented in the agencies’ Resource Conservation Plan summary forms, and for which dollar savings figures were provided.

Past performance has demonstrated that energy efficiency is a worthwhile investment. Current

budgetary constraints, coupled with the uncertainty of future energy prices, further emphasize the need to use energy resources efficiently.

FY 2006

Resource Conservation Plan



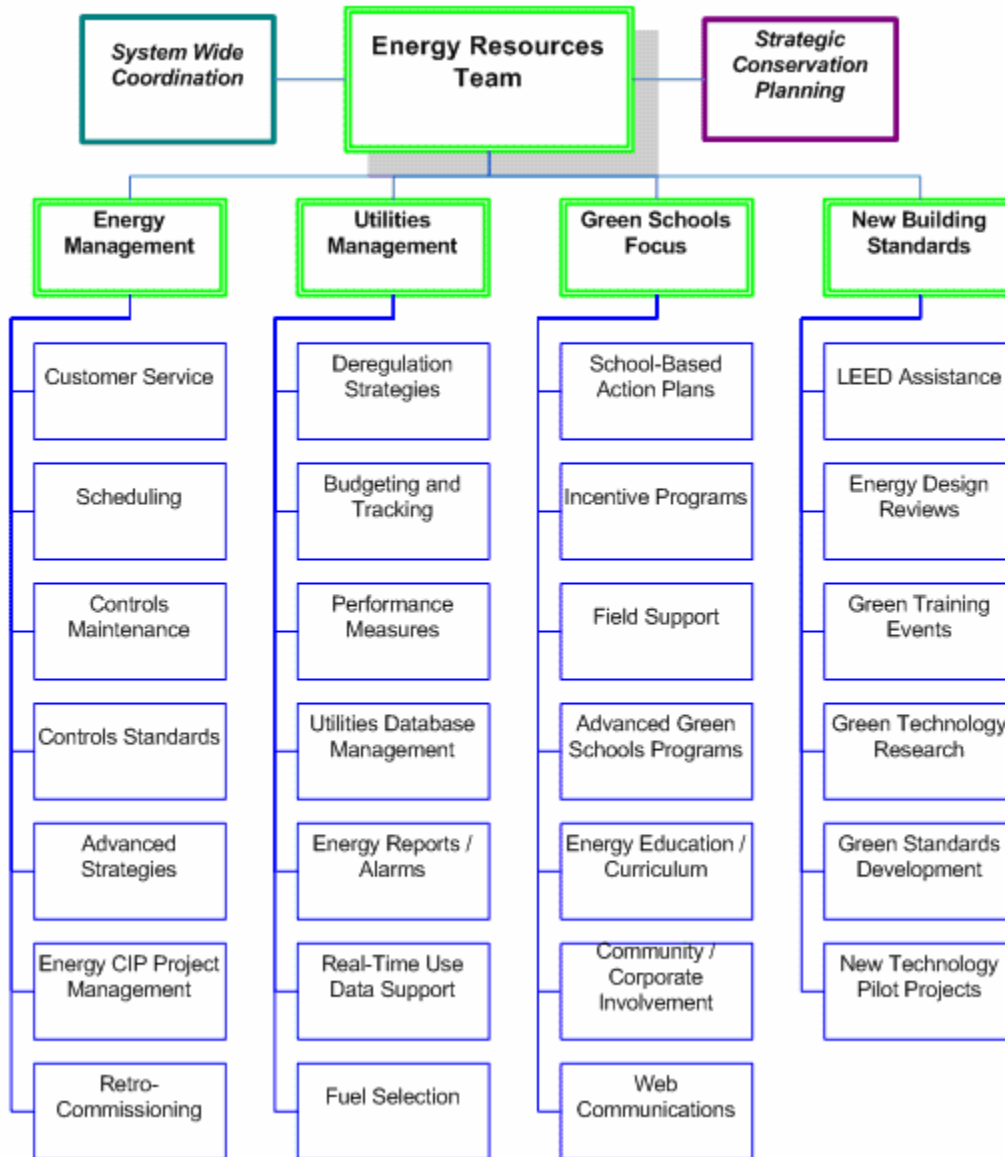
Montgomery County Public Schools
Maryland

Department of Facilities Management

November, 2004

Summary

Montgomery County Public Schools maintains a comprehensive program of resource conservation and management for its facilities. The following chart summarizes the program elements in place:



For additional information on these program initiatives, please visit our website at: www.greenschoolsfocus.org

The MCPS **Resource Conservation Plan** follows a standardized reporting format suggested by the Montgomery County Department of Environmental Protection. Energy information is formatted in predefined tables for easy reference, and consistent tracking of data from year to year. The categories of information presented are: [Facility Summary](#), [New Measures](#), [Existing Measures](#), and [Planned Measures](#). An [Innovations](#) section lists significant “firsts” achieved over the past year, and an [Appendix](#) lists conservation policies and guidelines.

Resource Conservation Plan
FY 2006
Summary

The information on this page reflects the facilities owned or operated
by this agency as of the end of **FY 04 (June 30, 2004)**

Agency	Montgomery County Public Schools, Maryland			
Number of Facilities	218	Change in number of facilities		+1
Total square feet	21,209,335	Change in total ft²		691,076
Average operating hrs/year	2940	Change in avg. operating hrs/year		+40
Other changes effecting energy consumption	<p>Technology Modernization: The Technology Modernization program adds a net 2,000 computers per year to the school system. Each one thousand new computers increases MCPS plug loads by 150 kW, equivalent to the energy of an average elementary school.</p> <p>Portable classrooms: Surging enrollment drives the use of relocatable classrooms (portables). Portables grew by 140 units in FY 02, and by 57 in FY 03, reaching a total of 719 in FY 05. Portables are electrically heated and cost over twice as much per square foot to operate as permanent school facilities. The portables added in FY 02 and FY 03 alone equal the utility impact of three new middle schools.</p> <p>Expanding summer use of schools: As schools have become air-conditioned, the summertime use of schools has also expanded. MCPS uses schools for a growing number of summer programs, as do 5,000 outside groups scheduled through the Community Use of Public Facilities. Annual operating hours and air-conditioning energy use are on the rise. In FY 02, the August electric bill for MCPS exceeded the September bill for the first time.</p>			

Utilities:	Units	Total consumption (actual FY 04)	Percent change from actual FY 03	Total cost (actual FY 04) \$	Percent change from actual FY 03
Electricity	kWh	194,288,169	0%	\$15,093,974	11%
Natural Gas (Firm)	therms	5,765,113	-10%	\$5,746,694	27%
Natural Gas (Irate)	therms	0 (burned FO#2)	0%	0 (burned FO#2)	0%
Fuel Oil #2	gallons	555,010	60%	\$612,815	78%
Propane	gallons	43,217	5%	\$51,697	5%
Water/Sewer	kgallons	405,965	-2%	\$1,963,148	13%
Total				\$23,468,328	16%

New Measures

The Table “**New Measures**” on the following page lists and describes energy retrofit activities occurring in the current fiscal year. New measures outside the Energy CIP are described below.

New Construction: In addition to the indicated retrofits, new building design guidelines generate substantial energy savings in each MCPS construction project. For example, the new Matsunaga Elementary School features a ground source heat pump HVAC system, and the planned Richard Montgomery High School replacement will have a similar system. Ground source heat pumps exchange heat with the earth through fields of closed-loop wells and reduce annual heating and cooling energy by 30% compared to conventional HVAC systems. New construction measures are not listed in this table due to the large number involved and because the cost and benefits of these measures are integrated into the total building design.

Utility Procurement: MCPS also controls utility costs through joint procurement efforts of deregulated energy supplies with other county and bi-county agencies. Joint procurement has produced significant utility savings for this group, including a six percent reduction in average electric rates through FY 04.

Environmental Standards: Beyond energy conservation measures, MCPS seeks to be environmentally responsible in all aspect of facility design and operation. New MCPS facilities are rated by the U.S. Green Building Council for certification under the Leadership in Energy and Environmental Design (**LEED**) program. This program recognizes sustainable design in facility sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Northwest Elementary School #7 is being designed as a **LEED** pilot project and was the first school in Maryland to register for **LEED** review. Three additional MCPS schools in design have now been registered as well.

“Because good planets are hard to find.....”

Anja Caldwell, AIA, LEED-AP

New Measures

This table shows information on resource conservation measures implemented during FY 05
(July 1, 2004 through June 30, 2005)

Measures - New: (Implemented during FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) affected and units	units saved per year	annual cost savings (\$)
Capital Improvement Projects:						
Daylight Dimming at Clopper Mill ES	12/04	\$ 70,000	(\$ 3,500)	Elect (kWh)	330,000	\$ 28,000
Internet Control of Portable Classrooms	8/04	\$350,000	0	Elect (kWh)	5,000,000	\$450,000
Waterless Urinals at MLK MS	10/04	\$ 10,000	(\$ 500)	Water (Gal)	560,000	\$ 4,000
Retro-Commissioning Wheaton / Edison HS	09/04	\$255,000	(\$ 8,000)	Elect (kWh)	420,000	\$ 43,000
Total		\$685,000	(\$12,500)			\$525,000
Operations and Maintenance:						
Shutdown of Network Computers	7/04	0	0	Elect (kWh)	3,060,000	\$275,000
Total		0	0			\$275,000
Description of Activities:						
<p>The "Internet Control of Portable Classrooms" is a first of its kind application to portable classrooms of Carrier's "Broadcast Energy Savings" (BES) technology. MCPS and Carrier jointly developed the approach in which an internet interface allows MCPS to synchronize the HVAC schedules and thermostat set points at all portables. The savings for this project is high because portables originally contained only manual thermostats and ran essentially uncontrolled. The use of conventional 7-day programmable (but non-communicating) thermostats is impractical in this application because of the inability to verify programs at over 700 locations, and inability of 7-day thermostats programs to schedule holidays, breaks, and summer closings. The BES interface supports a 24-hour override to a setback temperature, or "snow day" command, allowing MCPS to shut down portables and save energy opportunistically. The newly developed system makes it feasible for the first time to efficiently control large numbers of small, relocatable buildings with a payback of under a year.</p> <p>Waterless Urinals: Urinals are being tested that use no water for flushing, while improving sanitation and reducing restroom odors. One school and maintenance depot will be tested this year, with an anticipated payback of less than 3 years. If successful, this technology will be applied to 50 restrooms scheduled for work under the Restroom Renovations CIP.</p> <p>Shutdown of Network Computers: In addition to using Energy Star computer equipment, MCPS has this year instituted the system-wide shutdown of all 40,000 computers at the end of the evening via network controls. The network also sets Energy Star settings on each computer to deactivate the monitor after 30 minutes of idle time. Research is continuing to optimize these settings.</p>						

Existing Measures

MCPS has made significant investments in energy conservation going back to 1980. The table “**Existing Measures**” on the following page highlights the past six years of projects using Energy CIP funding.

Behavioral Measures: In addition to capital improvements, MCPS has long maintained a program of behavioral education to reduce energy use by facility users. The original **School Eco-Response Teams (SERT)** program (1991), and the more comprehensive **Green Schools Focus** (2002), continually promote and reward a culture of conservation in the school system. These programs communicate with the schools through professional development events, newsletters, curriculum modules, informational flyers, email, websites, and a telephone hot line and site visits. As rewards for participation, the programs offer project grants, quarterly cash awards, contest prizes, publicity, and application for national Earth Apple Awards. These programs produce hundreds of thousands of dollars a year in utility savings for the school system and help to instill environmental responsibility in future generations.

*“The problem of energy conservation has been solved, technically.
All that remains is 20 years of implementation.”*

Amory Lovins, Ph.D., Rocky Mountain Institute

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 05

Measures - Existing: (implemented from FY 98 to FY 05)	Date implemented (mo/yr)	Initial cost (\$)	Annual net impact on maintenance cost (\$)	Fuel type(s) affected and units	Units saved per year	Annual cost savings (\$)
Capital Improvement Projects:						
Lighting Retrofits	01/98	\$ 644,633	(\$25,325)	Elect kWh	2,992,939	\$209,506
Lighting Retrofits	01/99	\$ 467,748	(\$18,376)	Elect kWh	2,171,687	\$152,018
Lighting Retrofits	01/00	\$ 241,693	(\$ 9,495)	Elect kWh	1,122,147	\$ 78,550
Lighting Retrofits	01/01	\$ 193,471	(\$ 7,601)	Elect kWh	898,259	\$ 62,878
Lighting Retrofits	01/02	\$1,544,630	(\$60,682)	Elect kWh	7,171,498	\$502,005
Lighting Retrofits	01/03	\$ 237,000	(\$ 9,377)	Elect kWh	635,496	\$ 54,485
EMS Upgrades	01/03	\$ 161,000	0	Elect kWh	442,000	\$ 31,800
				NGTherms	18,500	\$ 15,200
Cooling Tower Water Monitors	01/03	\$ 65,000	(\$15,000)	Water Gallons	2,800,000	\$ 12,000
Total		\$3,555,175				\$1,118,442
Operations and Maintenance:						
Information Unavailable						
Total						
Description of Activities:						
<p>MCPS comprehensive lighting retrofits improve every lighting fixture in the building. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-Watt Mercury Vapor fixtures are replaced with 250-Watt Metal Halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent EXIT signs are changed to LED type. LED EXIT's consume only 5 Watts and never burn out, thus also improving the safety of the facilities.</p> <p>Cooling Tower Water Monitors detect excess water flow through cooling towers, caused by malfunctioning controls, and alert maintenance staff. The monitors send a pager signal to the responsible person, including the type of alarm and the facility number. Monitors were installed on 92 cooling towers owned by MCPS, averting water losses of hundreds of thousands of gallons per year.</p> <p>Operations and Maintenance: As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked.</p>						

Planned Measures

Energy Capital Improvement Program: A significant backlog of profitable energy projects exists in MCPS for energy management, lighting, and water conservation. The table “**Planned Measures**” on the following page reflects the target areas for the coming fiscal year. Planned Measures outside of the Energy CIP are described below.

Improved New School Design: MCPS seeks to attain a **LEED** Silver Level rating on all new building designs started in FY 2007 and beyond. Costs of LEED certification will be submitted in the FY 2007 budget requests for these schools.

New Green Schools: MCPS plans to continue Green Schools training and support to schools at rate of 10 per year, with a goal of eventually having all middle and high schools become green.

Expanded Incentive Program: In the area of occupant behavior, MCPS plans to expand its Green Schools Focus in FY 06 to achieve full participation of schools in SERT programs. MCPS is requesting a new staff of energy field representatives along with supporting technical and controls personnel to perform regular site visits to assist each school with energy monitoring, planning, auditing, energy awareness, and quality control measures to save energy. Additional savings from this expanded effort are projected to be over 1.60 times the cost invested.

Water Conservation Retrofits: In the area of water conservation, MCPS plans to incorporate successful technologies from pilot studies into design for a 50-school Restroom Renovations Capital Improvement Project.

High-efficiency Relocatables: MCPS plans to pilot a high-efficiency design for relocatable classrooms to include a highly insulated thermal envelope with integrated daylighting for lighting savings and improved student performance.

“We hope for a delightful, safe and healthy world, with clean water, renewable power, economically, equitably, ecologically and elegantly enjoyed.”

William McDonough and Michael Braungart

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 06 (July 1, 2005 through June 30, 2006)

Measures - Planned: (for FY05)	Projected completion date (mo/yr)	Projected initial cost (\$)	Projected annual net impact on maintenance cost (\$)	Fuel type(s) affected and units	Estimated units saved per year	Projected annual cost savings (\$)
Capital Improvement Projects:						
EMS Upgrades	03/06	\$ 355,000	\$0	NG Therms	31,300	\$31,000
				Elect kWh	971,000	\$68,000
Lighting Retrofits	03/06	\$ 145,000	(\$5,000)	Elect kWh	543,000	\$38,000
Total		\$500,000	-5,000			\$137,000
Operations and Maintenance:						
Information unavailable						
Total						
Description of Activities:						
<p>The above project list is contingent on increased funding approved in the FY 05 to 10 Energy CIP.</p> <p>Energy Management Upgrades: The infrastructure of energy management systems at MCPS has reached an age where many systems need to be replaced or upgraded. Advances in electronics and communications now enable deeper savings from energy management systems than previously possible. Also, new network interface standards can now distribute real-time EMS data instantly to widely distributed facility users and staff. Access to building automation data across the Wide Area Network multiplies the value of energy management systems well beyond the simple energy savings shown above. These and other strategic improvements will be made during the systematic EMS upgrade initiative.</p> <p>Operations and Maintenance: As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked.</p>						







Significant Technology and Program Advances in Resource Conservation

- 1) First use of **Internet-communicating thermostats** in a U.S. school system to control HVAC in portables.
- 2) **First School System in Maryland** to register a new building design for LEED Certification (NWES #7). Four building designs are now registered in total.
- 3) First **MCPS Green Schools** supported by Green Schools Focus staff and modeled on the national Green Schools program of the Alliance to Energy:
 - a. Twenty secondary schools have received training, including sessions on an **investigation-based approach** for energy and environmental activities,
 - b. Use of professional instrument **Toolkits**, and
 - c. Energy-related **curriculum** materials and support.
- 4) First deployment of a **Web interface in MCPS** to view real-time building information.
 - a. Twenty schools are now “on-line” to anyone on the MCPS-wide area network to view building environmental conditions through a web browser.
- 5) First use of a **Web-based system to monitor daily electric profiles** in buildings and detect abnormal use patterns, control, and scheduling problems.
 - a. Forty-nine sites are installed under the PEPCO “CEO Online” subscription program.
 - b. A 10-building pilot project is testing a similar and less expensive approach completely owned by MCPS.
- 6) First MCPS use of the **automated scheduling database** operated by the ICB / Community Use of Public Facilities program to receive HVAC scheduling requests from three school clusters in place of paper calendars manually filled out by school staff:
 - a. This system will be extended to all elementary and middle schools in FY 05.

-
- 7) First systematic **Retro-Commissioning** of MCPS facilities to correct controls failures, improve comfort, and reduce energy expenses (six facilities to date).
 - 8) First MCPS school opened with a **Geoexchange system** for heating and cooling:
 - a. Spark Matsunaga Elementary School and Longview Center, 125,000 square feet.
 - b. First MCPS school to have no comfort complaints in the first two years of operation.

Appendix – Montgomery County Public Schools

Resource Conservation Policy and Guidelines

-  [BOE Policy On Energy Conservation](#)
-  [Electricity Guidelines](#)
-  [Heating Guidelines](#)
-  [Food Preparation Guidelines](#)
-  [Water Use Guidelines](#)
-  [High Performance Green Building Plan for MCPS](#)

POLICY

BOARD OF EDUCATION OF MONTGOMERY COUNTY

Related Entries: ECM, ECM-RA
Responsible Office: Supportive Services

Energy Conservation

A. PURPOSE

To ensure that Montgomery County Public Schools pursues energy conservation efforts and practices that continue to preserve our natural resources while providing a safe and comfortable learning environment for all staff and students

B. ISSUE

The nation is experiencing a depletion of its natural resources which include crude oil, natural gas, and other energy sources. The Montgomery County Public Schools is committed to reducing its consumption of natural resources and still improving the quality of its educational programs. The Montgomery County Board of Education desires to work with other agencies of government and plan school system activities so that the learning environment of essential education programs are not curtailed or compromised.

C. POSITION

1. The superintendent of schools shall continue to establish procedures to ensure the conservation of natural resources by personnel at all levels of the school system, which shall include the following practices:
 - a) Generation of a systemwide resource conservation plan that outlines goals and objectives
 - b) Development of acceptable energy conservation guidelines as outlined in the resource conservation plan
 - c) Continued development and implementation of conservation programs
 - d) Performance of energy studies on all new MCPS construction
 - e) Monitoring the general operation and maintenance of all heating, ventilation and air-conditioning equipment
 - f) Procurement and consumption management of fossil fuels and electricity

1 of 2

- g) Continuing reminders to staff and students of the need for conservation of all natural resources
- 2. MCPS will participate in a coordinated effort by government authorities to establish appropriate resource conservation plans and utility price monitoring systems to ensure that public schools have adequate supplies of essential fuels and can obtain these at the best possible prices.

D. DESIRED OUTCOME

Create a healthy and comfortable learning environment while controlling energy consumption more efficiently and diverting the otherwise rising utility costs towards educational programs. Continue development of energy conservation efforts that proportionally reduces energy consumption in new and existing facilities.

E. IMPLEMENTATION STRATEGIES

- 1. Should natural resources be insufficient to meet normal operating needs, the superintendent will develop further plans for the consideration of the Board of Education to conserve energy.
- 2. Copies of this policy and the annual resource conservation plan will be sent to appropriate school system and county government officials.

F. REVIEW AND REPORTING

This policy will be reviewed on an on-going basis in accordance with the Board of Education's policy review process.

Policy History: Adopted by Resolution No. 654-73, November 13, 1973; amended by Resolution No. 285-97, May 13, 1997.

Electricity

1. **Temperature Set Point:** The maximum cooling level is 76° F. Set thermostats accordingly. Some temperature variation will occur as equipment cycles on and off. Report cooling problems only if room temperature measured with a thermometer stays three degrees or more above set point.
2. **Controls:** Do not attempt to tamper with energy management or HVAC controls on equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed and compressor run time. Test and calibrate all pneumatic thermostats at the start of each cooling season.
3. **Computers:** Shutting down computers not in use is important. Computers in our schools consume more energy than the lighting. **Teachers and students should shut down the computer at the end of each use, unless a new user is waiting.** Sweeps should be made to shut down all computers immediately after school hours and before weekends, holidays, and breaks. Use of **flat panel monitors** is encouraged whenever procuring new displays. Flat panel monitors use 70% less energy than CRT models and help reduce excessive heat build-up in computer labs and closets.
4. **Lights:** Teachers should ensure lights are turned off when leaving the classrooms empty, even for a few minutes. Every effort should be made to avoid accidentally leaving lights on in storerooms, crawl spaces, attics, and other unoccupied spaces. Corridor lighting should be reduced in over-illuminated areas and turned off during unoccupied periods. Gym, auditorium, and stadium lights should be controlled on a tight schedule. Gym lights should be turned off during class periods the gym is not in use.
5. **Lighting Maintenance:** Maintain automatic lighting controls, occupancy sensors, or daylight sensors where installed. Light fixtures and lenses should be cleaned annually and the date documented.
3. **Daylighting:** Whenever possible, teachers should utilize natural light instead of artificial light. Window shades should be adjusted to make best use of daylighting. Because most classroom lights are controlled by two or more switches, maximum lighting and lights nearest the windows should be used only when daylight is not available.
4. **Exterior Lighting:** All outside lighting shall be **off** during daylight hours. Parking lot lights should be turned off at the close of the regular school day or evening activities (by 12:00 a.m. at the latest). Building service managers should seasonally check/reset the time clock for all outside lighting.
5. **Cleaning Crews:** All lights will be turned **off** when students and teachers leave school. Building service workers will turn on lights only in the areas in

which they are currently working.

6. **Holidays and Breaks:** All electrical equipment will be shut down or unplugged per checklists before long weekends and school breaks.
7. **Off-Peak Use:** When possible, electricity use (for kilns, laminators, etc) should be scheduled prior to 12:00 noon when lower, off-peak rates are in effect.
8. **Personal electric space heaters** will not be permitted. Such units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated.
9. **Infiltration Control:** All windows and outside doors will be kept closed when cooling systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.
10. **Vending Machines:** Vending machines are major electric users that often cost more to operate than the school receives in revenues. A typical soft drink machine costs over \$400.00 per year to operate, and there are over a thousand in the school system. Measures should be taken to minimize the number of vending machines and the hours of use:
 - a. Review your school's vending machine use and have little-used units removed.
 - b. By BOE Action 12.8.2, vending machines serving food of "minimal nutritional value" must be unplugged or automatically turned off from midnight to the end of each school day.
 - c. Vending machines must be removed from the main entrance or lobby of all schools effective with the 2004-2005 school year.
 - d. Vending machines also may not be located anywhere in a corridor where it reduces the code egress path width.
 - e. Unplug vending machine units when "Sold Out" is displayed.
 - f. Unplug vending machine units for non-perishable items when vandal gates are closed.

Heating

1. **Temperature Setpoint:** The maximum heating level is 70° F. Set thermostats accordingly and recheck monthly. Some temperature variation will occur as equipment cycles on and off. Report heating problems only if room temperature measured with a thermometer stays three degrees or more below set point.
2. **Controls:** Building staff or occupants should not attempt to manually control equipment by tampering with energy management or HVAC controls of equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed and compressor run time. Test and calibrate all pneumatic thermostats at the start of each heating season.
3. **Hours:** During non-school hours, heat is furnished only for MCPS activities and user groups with reservations through the ICB/CUPF. Consolidate necessary MCPS evening activities into the minimum number of zones possible. HVAC will not be provided for an individual to use a classroom or office outside of normal hours. HVAC systems will remain off during cleaning, except when ventilation is required for waxing or stripping activities.
4. **Filters:** Replace filters of all equipment at recommended intervals. Maintain documentation per your building maintenance plan.
5. **Boiler Maintenance:** Fuel oil burners should be cleaned and tuned for optimum combustion twice yearly.
6. **Pumps:** Only one main heating pump should be operated, except where additional pumps are provided for separate zones. Do not operate main pump and standby pump at the same time.
7. **Unit Ventilators:** Maintain unit ventilators free of obstruction, such as books, plants, and furnishings, both on the top grill and at the bottom intake, so that air can circulate efficiently throughout the room.
8. **Infiltration Control:** All windows and outside doors will be kept closed when heating systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.
9. **Storage Spaces:** Close unused storage rooms and set thermostat controls, where installed, to the lowest possible temperature setting that will prevent freezing.
10. **Personal electric space heaters** will not be permitted. Such units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated.

Food Preparation

Cooking Equipment

1. Preheat only equipment to be used ... 15 minutes before using.
2. Reduce temperature or turn equipment off during slack periods.
3. Cook full loads on every cooking cycle when possible.
4. Use the correct size equipment for all operations.
5. Avoid slow loading and unloading of ovens and opening doors unnecessarily.
6. Keep equipment clean for efficient operation.

Hot Food Holding and Transporting

1. Preheat equipment before loading.
2. Always use at full capacity ... when possible.
3. Clean thoroughly daily.

Refrigeration Equipment

1. Keep doors tightly closed and avoid frequent or prolonged opening.
2. Place foods in refrigerator or freezer immediately upon arrival from supplier.
3. Keep evaporator coils free of excessive frost.
4. Keep condenser coils free of dust, lint or obstructions.
5. Unplug equipment that is not needed.

Ware Washing Equipment

1. Always operate equipment at full capacity when possible.
2. Flush after heavy meal periods--clean thoroughly, daily.

Water Heating

1. Repair leaking faucets as soon as possible.
2. Reduce storage temperature to 120° F where possible.
3. Insulate hot water pipes.

Ventilating System

1. Use only the number of fans necessary at all times to provide adequate ventilation.
2. Turn fans off upon completion of cooking.
3. Operate two-speed fans on the lower speed ... when possible.
4. Keep filters and extractors clean.

WATER USE

GENERAL

1. **Be alert for water leaks** and water main breaks. Look for continuous water flow through the water meter at any time, ponding of water around the building, and report leaks to maintenance immediately. A broken water main can release tens of thousands of dollars in water a week until it is repaired.
2. **Report and repair leaking faucets** and faulty flush valves promptly. Check and adjust valves for proper timing annually.
3. **Water is an MCPS resource and not to be given away** or used by outsiders. Do not provide free water to road maintenance tankers or any other non-MCPS agency.
4. Do not allow local residents to use school hose bibbs or to control irrigation.
5. **Car washes may not** use school water supplies.
6. The utility budget pays for bottled water only in elementary school portable classrooms.

IRRIGATION

These general guidelines are supplied for the education of individuals operating turf irrigation equipment to help with the successful management of healthy turf.

1. **Avoid Excess Watering.** Excessive watering promotes fungal growth and prevents the development of long, deep root systems needed for healthy turf.
 - a. **Use a simple rain gauge.** Turf in our climate needs only 1" of water per week for optimum health. Use weather reports or your school's rain gauge to determine whether irrigation is needed each week.
 - b. **With timer systems, check zones for proper saturation levels.** Make sure water saturates the root zone when irrigating but no further. No runoff should occur from the area being watered.
 - c. **Make sure irrigation systems are turned off when it rains.** The installation of rain switches on automated irrigation systems is highly recommended.
2. **Irrigate only in early morning or late evening hours.** This timing minimizes evaporation to the air.
3. **Irrigate only two or three times a week.** This interval promotes deeper root growth, which establishes healthier and sturdier turf.

FY 05 High Performance Green Building Plan for MCPS

1. MCPS LEED™ Pilot Projects
2. Greening of the MCPS Standard Design Guidelines
3. Sustainable Design Review
4. Training of MCPS Staff in High Performance Green Building Technologies and Processes
5. Experience in High Performance School Design and LEED™ Requirement for MCPS Requests for Qualifications and Proposals
6. Green Building Technology Pilots
7. Operations and Maintenance of High Performance Green School Buildings
8. LEED™ Application Guide for Schools
9. MCPS LEED™ Application Template
10. Updates

1. MCPS LEED™ Pilot Projects

As a pilot project, the new Northwest Elementary School #7 in Germantown is currently being designed and evaluated for a certification under the LEED™ version 2.1 for new construction (Leadership in Energy and Environmental Design, see www.usgbc.org/leed) system. Three other schools, Clarksburg/Damascus ES #7, Northeast ES #16 and Downcounty Consortium ES #28 are also currently registered with the US Green Building Council. These schools are all part of the 2005-2010 CIP and scheduled for completion in September 2006.

The pilot of Northwest ES #7 was initiated at a MCPS system wide LEED Charrette in the summer of 2003 (see www.greenschoolsfocus.org). The project is scheduled to bid in January of 2005 with a completion date of September 2006. The project design incorporates several green building technologies as add alternates to ensure the base project is affordable within the allocated funds. Any additional initial investment costs for green building components will be identified and implemented as the project budget allows. The base project is currently at a basic LEED certification level and a recent assessment indicates that a LEED Silver certification can be achieved with the acceptance of all the identified additional alternates.

The construction budgets for these projects were allocated prior to the launch of the “High Performance Building Plan for MCPS 2003”(see www.greenschoolsfocus.org), which initiated the first MCPS green building initiative in FY 04. The schools have no additional budget allocations for high performance green building technologies that exceed current MCPS Facility Design Guidelines.

The Department of Facilities Management with the Division of Construction chose to apply the LEED rating system to the design process to streamline system integration and energy efficiency of these projects. This decision was based on the documented benefits of sustainable design practices and green building technologies. Research and data published by the US Green Building Council (USGBC, see www.usgbc.org) show significant potentials for cost savings in maintenance and operations of LEED schools.

Key to avoiding extra costs was introducing the LEED rating system early in the design process. All four schools had recently undergone feasibility studies and were going into schematic design, so the timing was right. Therefore all four elementary schools got registered for a LEED certification with the USGBC.

As the pilot projects are currently underway, project costs and benefits will be evaluated as a basis for developing project budgets for future LEED™ projects. A system wide goal for a LEED certification status and level will be determined when the merit of the current LEED pilots can be evaluated.

2. Greening of the MCPS Standard Design Guidelines

Facility Design Guidelines: A thorough review of the Facility Design Guidelines CSI Division 1 through 16 has taken place by a sustainable design consultant, project managers at the Division of Construction and the Green Schools Program Manager. The results and an index have been presented to the Director of School Plant Operations and the Division of Maintenance, including the IAQ Team, end of October 2004. A last review will be compiled by the Green Schools Focus and submitted to the Division of Construction for distribution to the AE teams end of 2004.

Other Guidelines: It was determined at the Green Spec Meeting in October 2004 that the following additional documents need to be compiled by sub-committees by end of 2004:

- Indoor Air Quality Management Plan during Construction
- Construction Waste Management Plan
- Review of HVAC and Commissioning Guidelines according to LEED Standards
- Review of Lighting Standards according to LEED Standards

3. Sustainable Design Review

A Sustainable Design and LEED™ Review by the Green Schools Focus will be part of the design review processes at the Division of Construction, from the feasibility study to the construction documents of all new construction projects and major renovations.

The project managers at the Green Schools Focus are to be invited by the Division of Construction to the various milestone design meetings with the design team. The project managers will compile the comments and distribute them to the consultants.

The LEED related categories of site, water, energy, materials and resources and IAQ will be the focus of the review, with an emphasis on energy efficiency of envelope, operations, building systems and lighting.

4. Training of MCPS Staff in High Performance Green Building Technologies and Processes

A LEED Intermediate workshop has been conducted for MCPS Department of Facilities Management staff in 2003. It is a goal to have all project managers at the Division of Construction certified as a LEED Accredited Professional by end of 2005.

The Green Schools Focus will continue to provide informal training sessions in the form of seminars, product presentations and luncheons at the Division of Construction. The Green Schools Focus will also continue to distribute information about conferences, seminars, workshops and tours focusing on high performance green schools and LEED on a national level and in the region.

5. Experience in High Performance School Design and LEED™ Requirement for Consultants Selection Process

In the consultants selection process firm experience in high performance green school design and LEED will be added to the criteria for Requests for Qualifications from consultants. MCPS advises consultants to have LEED Accredited Professionals on the design team working on capital MCPS projects.

The resumes of the design team members are part of the initial application and any changes or replacements in team members need to be approved by the Division of Construction at MCPS. Qualifications in regard to high performance green design and LEED™ will be submitted for review by the Green Schools Program Manager.

6. Green Building Technology Pilots

Several pilot projects for green building technologies have been started in 2004 for existing buildings and portables classrooms. The Green Schools Focus has developed a protocol to track these pilot projects and will distribute the proposed format among the divisions involved. The protocol will determine the evaluations of the technologies and continue to inform the design for new constructions and renovations. Current pilot projects are described in the latest MCPS Resource Conservation Plan.

7. Operations and Maintenance of High Performance Green School Buildings

Green Cleaning products and procedures according to the principles of the Green Seal guidelines have been introduced to the Division of School Plant Operations. The Division is evaluating the certification and will introduce a “Green Vendor Day”.

8. LEED™ Application Guide for Schools

MCPS is actively involved in the development of the LEED™ Application Guide for Schools (LEED™ AGS). The Green Schools Program Manager at MCPS is serving on the national USGBC LEED™ for Schools Committee as an elected member. The guide is scheduled for completion for summer 2005 and will be a supplement to LEED™ for New Construction Version 2.2.

MCPS’ experience in implementing LEED™ will inform the USGBC committee and the committee work will inform MCPS about future adaptations that are expected to facilitate the application of the LEED™ rating system to our schools.

9. MCPS LEED™ Application Template

MCPS has developed a general MCPS LEED™ Application Template which is modeled after the LEED™ Scorecard that determines the goal for individual credits for all projects and pilots. The scorecard is at the end of this plan on page 6 and 7.

The scorecard shall be distributed to all consultants at the beginning of any capital project to guide the design process.

This approach was chosen in lieu of developing a separate comprehensive MCPS LEED™ Application Guide, as initially intended in the 2003 High Performance Building Plan for MCPS under 5.2.3, since MCPS has now an active role in the USGBC committee mentioned under section 8. of this plan.

10. Updates

This plan will be reviewed and updated biannually in October, to coincide with the CIP budget submission planning cycle for Construction, and the annual DFM Resource Conservation Plan. A list of certification goals for upcoming projects will be updated and attached.

MCPS LEED™ -NC 2.1 Application Template 2004

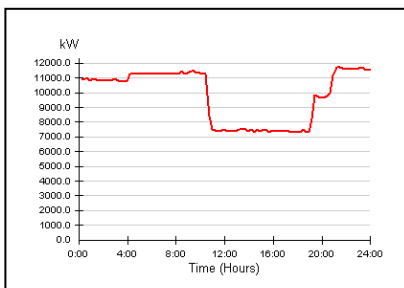
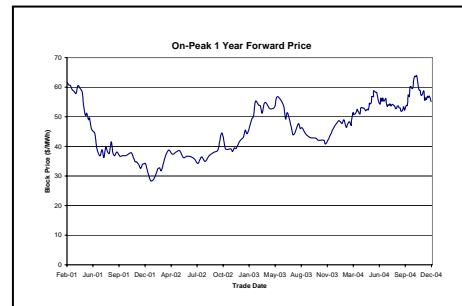
	LEED 2.1 Prerequisites and Credits		All Projects	Pilot Projects	Site Specific	Not Likely
SUSTAINABLE SITES	Site Prerequisite: Erosion & Sedimentation Control		X	X	X	
	Site Credit 1: Site Selection				X	
	Site Credit 2: Urban Redevelopment				X	
	Site Credit 3: Brownfield Redevelopment					X
	Site Credit 4: Alternative Transportation	4.1 Public Transportation Access			X	
		4.2 Bicycle Storage & Changing Rooms	X	X		
		4.3 Alternative Fuel Refueling Station				X
		4.4 Parking Capacity		X	X	
	Site Credit 5: Reduced Site Disturbance	5.1 Protect or Restore Open Space		X	X	
		5.2 Development Footprint		X	X	
	Site Credit 6: Stormwater Management	6.1 Rate and Quantity		X	X	
		6.2 Treatment		X	X	
	Site Credit 7: Heat Island Reduction	7.1 Non-roof		X	X	
		7.2 Roof	X	X		
	Site Credit 8: Light Pollution Reduction		X	X	X	
WATER EFFICIENCY	Water Credit 1: Water Efficient Landscaping	1.1 Reduce by 50%	X	X	X	
		1.2 No potable Use or No Irrigation		X	X	
	Water Credit 2: Innovative Wastewater Technologies				X	
	Water Credit 3: Water Use Reduction	3.1 20% Reduction	X	X		
		3.2 30% Reduction		X		
ENERGY AND ATMOSPHERE	Energy Prerequisite 1: Fundamental Building Systems Commissioning		X	X		
	Energy Prerequisite 2: Minimum Energy Performance		X	X		
	Energy Prerequisite 3: CFC Reduction in HVAC&R Equipment		X	X		
	Energy Credit 1: Optimize Energy Performance	1.1 20% New/ 10% Existing	X	X		
		1.2 30% New/ 20% Existing	X	X		
		1.3 40% New/ 30% Existing	X	X		
		1.4 50% New/ 40% Existing			X	X
		1.5 60% New/ 50% Existing			X	X
	Energy Credit 2: Renewable Energy	2.1 5%		X	X	
		2.2 10%			X	X
		2.3 15%			X	X
	Energy Credit 3: Additional Commissioning		X	X		
	Energy Credit 4: Ozone Protection			X		
	Energy Credit 5: Measurement and Verification		X	X		
	Energy Credit 6: Green Power			X		

	LEED 2.1 Prerequisites and Credits		All Projects	Pilot Projects	Site Specific	Not Likely
MATERIALS AND RESOURCES	Materials Prerequisite: Storage and Collection of Recyclables		X	X		
	Materials Credit 1: Building Reuse	1.1 Maintain 75% of Existing Structure & Shell			X	
		1.2 Maintain 100% Existing Structure & Shell			X	
		1.3 Maintain 100% of Structure & Shell & 50% of Non-shell			X	
	Materials Credit 2: Construction Waste Management	2.1 Divert 50%	X	X		
		2.2 Divert 75%	X	X		
	Materials Credit 3: Resource Reuse	3.1 Specify 5%		X	X	
		3.2 Specify 10%				X
	Materials Credit 4: Recycled Content	4.1 Specify 5%	X	X		
		4.2 Specify 10%		X		
	Materials Credit 5: Local/Regional Materials	4.3 20% Manufactured Locally	X	X		
		4.4 Of 20% Above, 50% Harvested Locally		X		
	Materials Credit 6: Rapidly Renewable Materials			X		
	Materials Credit 7: Certified Wood		X	X		
INDOOR ENVIRONMENTAL QUALITY	Prerequisite 1: Minimum IAQ Performance		X	X		
	Prerequisite 2: Environmental Tobacco Smoke (ETS) Control		X	X		
	IEQ Credit 1: Carbon Dioxide (CO ₂) Monitoring		X	X		
	IEQ Credit 2: Increase Ventilation Effectiveness			X		
	IEQ Credit 3: Construction IAQ Management Plan	3.1 During Construction	X	X		
		3.2 Before Occupancy		X		
	IEQ Credit 4: Low-Emitting Materials	4.1 Adhesives & Sealants	X	X		
		4.2 Paints	X	X		
		4.3 Carpet	X	X		
		4.4 Composite Wood		X		
	IEQ Credit 5: Indoor Chemical and Pollutant Source Control			X		
	IEQ Credit 6: Controllability of Systems	6.1 Perimeter	X	X		
		6.2 Non-perimeter		X		
	IEQ Credit 7: Thermal Comfort	7.1 Comply with ASHRAE 55-1992	X	X		
		7.2 Permanent Monitoring System	X	X		
	IEQ Credit 8: Daylight and Views	8.1 Daylight 75% of Spaces	X	X	X	
		8.2 Views 90% of Spaces	X	X	X	
INNOVATION AND DESIGN PROCESS	Credit 1: Innovation in Design (subject varies)	1.1 Additional Locally Manufactured Material	X	X		
		1.2 Green O&M Program	X	X		
		1.3 User Education Program	X	X		
		1.4 TBD		X	X	
	Credit 2: LEED™ Accredited Professional		X	X		

Created by Sustainable Design Consulting in Annapolis for MCPS facilities.



WASHINGTON SUBURBAN SANITARY COMMISSION



Resource Conservation Plan- FY'06

Prepared by Rob Taylor, Energy Manager
The Production Team
January 2005



**WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2006
RESOURCE CONSERVATION PLAN**

Summary

The information on this page reflects the facilities owned or operated
By WSSC as of the end of **FY 04 (June 30, 2004)**

Number of Facilities	201	Change in number of facilities	0
Total square feet	N/A	Change in total ft ²	N/A
Average operating hrs/year	N/A (most 24/7)	Change in avg. operating hrs/year	N/A
Other changes effecting energy consumption	See Narrative		

Utilities:	units	total consumption (actual FY 04)	Percent change from actual FY 03	total cost (actual FY 04) \$	Percent change from actual FY 03
Electricity	kWh	210,441,184	+2%	\$11,100,621	+1.4%
Natural Gas (firm)	therms	296,167	+7.4%	\$336,009	50.3%
Natural Gas (Irate)	therms	433,048	20.4%	\$344,983	77.2%
Fuel Oil #2	gallons	43,442	-20.0%	\$53,185	+8.4%
Propane	gallons	7,132	+6%	\$11,420	133%
Water/Sewer	gallons	N/A	N/A%	N/A	N/A%
Total				\$11,846,218	3.7%



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New Measures

This table shows information on resource conservation measures implemented during FY 05
(July 1, 2004 through June 30, 2005)

Measures - New: (Implemented during FY 05)	date implement ed (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$)
Capital Improvement Projects:						
Energy Performance Project Phase IIA - Parkway Solids Upgrade (startup/commissioning)	7/04- present	\$1,289,000	-\$291,000	N/A	N/A	\$291,000 (won't take effect until FY'06)
Total, CIP						\$0
Operations and Maintenance:						
Pump Turbine Utilization (Rocky Gorge)	7/04- present	\$0	\$0	Electric	6,028,000 kWh	\$226,000
Electric Supply/Load Shifting – Energy (vs. SOS)	7/04- present	\$0	\$0	Electric		\$860,000
Electric Supply/Load Shifting – Capacity	7/04- present	\$0	\$0	Electric	5 MW	\$160,000
Total, O&M						\$1,246,000
Page Total						\$1,246,000
Description of Activities:						
See narrative						



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Existing Measures

This table shows information on resource conservation measures implemented prior to FY 05

Measures - Existing: (implemented from FY 98 to FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenan ce cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$)
Capital Improvement Projects:						
Variable Frequency Drives	FY 01-03	\$250,000		Electric	1,000,000 kWh	\$50,000
					1000 kW	\$50,000
Total, CIP					1,000,000 kWh 1000 kW	\$100,000
Operations and Maintenance:						
Load Curtailment	FY 98-03	\$0		Electric	3,000 kW	\$100,000
Pump Turbine Utilization (Rocky Gorge)	FY 98-04	\$0		Electric	2,000,000 kWh	\$100,000
Aggregated Electric Supply Procurement- Pepco accounts	FY 00-03	\$0		Electric	0	\$150,000
Total, O&M					2,000,000 kWh 3,000 kW	\$350,000
Page Total					3,000,000 kWh 4000 kW	\$450,000
Description of Activities:						
See narrative						



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Planned Measures

This table shows information on resource conservation measures planned
To be implemented in FY 06 (**July 1, 2005 through June 30, 2006**)

Measures - Planned: (for FY06)	projected completion date (mo/yr)	projected initial cost (\$)	projected annual net impact on maintenance cost (\$)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings (\$)
Capital Improvement Projects:						
Energy Performance Project- Phase IIB	12/31/06	\$9,000,000		Electricity		\$750,000
				Natural Gas		\$250,000
Total, CIP						
Operations and Maintenance:						
Energy Performance Project- Phase IIC- Electric Supply/Supply Mgmt.						\$1,500,000
					5000 kW	\$160,000
Total, O&M						\$2,660,000
Page Total						
Description of Activities:						
See narrative						



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MISSION- WSSC ENERGY MANAGEMENT:

Our mission is to optimize the usage, reliability, and cost of electricity, natural gas, fuel oil, propane, and diesel fuel in conjunction with maintaining or improving the quality of operation and maintenance of all water/wastewater treatment plants, pumping stations, storage sites and field offices.

MAJOR INITIATIVES:

Energy Information System (EIS)

The 1st phase of an Intranet-based energy billing and tracking system was completed in August 2003, and included the automatic calculation of electricity billing components (Distribution as well as Generation & Transmission rates) costs based on manual or electronic batch file entry of kWh and kW components. The 2nd phase of the project was begun in March 2004, as a part of Energy Performance Project Phase IIC (Electric Supply). Blocks of electric supply, representing baseload, are bid periodically, on the wholesale market (Figure 1, below). Actual usage and hourly prices are based on real-time hourly prices and usage of each facility. The invoices are sent electronically (from Constellation Energy Source, our current supply broker), are data intensive, and are delivered via the Internet in Excel spreadsheet format with up to 10,000 lines of energy price and interval usage data. To verify that these invoices are correct, EIS now imports real-time energy price data downloaded monthly from the PJM independent system operator (ISO), and calculates electronically in seconds what it would take hours to do manually.

When electricity supply invoices are e-mailed by the ESCO, they are imported into EIS and verified (checked) electronically. EIS uses the independently gathered energy price data and the defined purchase specification per the supply contract to calculate all energy, transmission, and ancillary costs and hedge costs. Interval meter data presented in the ESCO invoice will eventually be validated with inputs from the SCADA system. Total energy usage is validated from the EDC invoices. Figure 4 shows the results of importing and verifying an ESCO invoice file containing seven invoices. EIS can also compare the cost of supply vs. the current SOS rates to track cumulative savings.

Electricity invoices from 4 different electric utilities as well as Constellation for electric supply are entered into EIS for energy supply and transmission & distribution components. Account monitoring and invoice activity reports in EIS distinguish different types of invoices by color coding rows. Figure 2 below illustrates an account view in the foreground window showing that the invoice imported (background window) is now present in the list of invoices for the account with a highlight color in the row indicating an ESCO (Electric Supply) invoice. The yellow highlighted row is the ESCO invoice, which contains the generation and transmission charges, and the white row contains the distribution company invoice, which contains the distribution charges. The Account Summary window in the foreground totals all cost components that are contained in the different types of invoices.



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http://localhost:8081/EIS2/IsoPurchaseSpecAction - Microsoft Internet Explorer

ISO Purchase Specifications (new)

Grid Node	Start	End	On Peak MW	On Peak Price	Off Peak MW	Off Peak Price	Allocation	edit
BGE	07/01/04	06/30/05	4	\$58.71	3	\$38.30	4	edit
PEPCO	07/01/04	06/30/05	17	\$48.10	17	\$48.10	13	edit
PEPCO ▼	07/01/04	06/30/05	17	\$48.10	17	\$48.10	Allocation	save delete

Site Allocation
[close](#)

new

Account #	Site	On Peak	Off Peak	edit
Total Allocated:		17.000	17.000	
2762133011	NEELSVILLE	0.001	0.001	edit
5004123005	BROAD CREEK	0.496	0.496	edit
3101006405	CENTRAL AVE	0.458	0.458	edit
2024107803	WHEATON	0.026	0.026	edit
2774666826	SENECA-2	0.097	0.097	edit
5003481008	WESTERN BRANCH	2.904	2.904	edit
4125010019	ANAC-2	0.852	0.852	edit
2231030624	GOSHEN RD	0.081	0.081	edit
2002872717	COLESVILLE	0.003	0.003	edit
2002072508	POTOMAC	10.562	10.562	edit
2019160205	SENECA	1.406	1.406	edit
2824563817	REDDY BRANCH	0.054	0.054	edit
3089962116	HYATTSVILLE	0.06	0.06	edit

Local intranet

Figure 1. Block Bid Prices and Account Allocation



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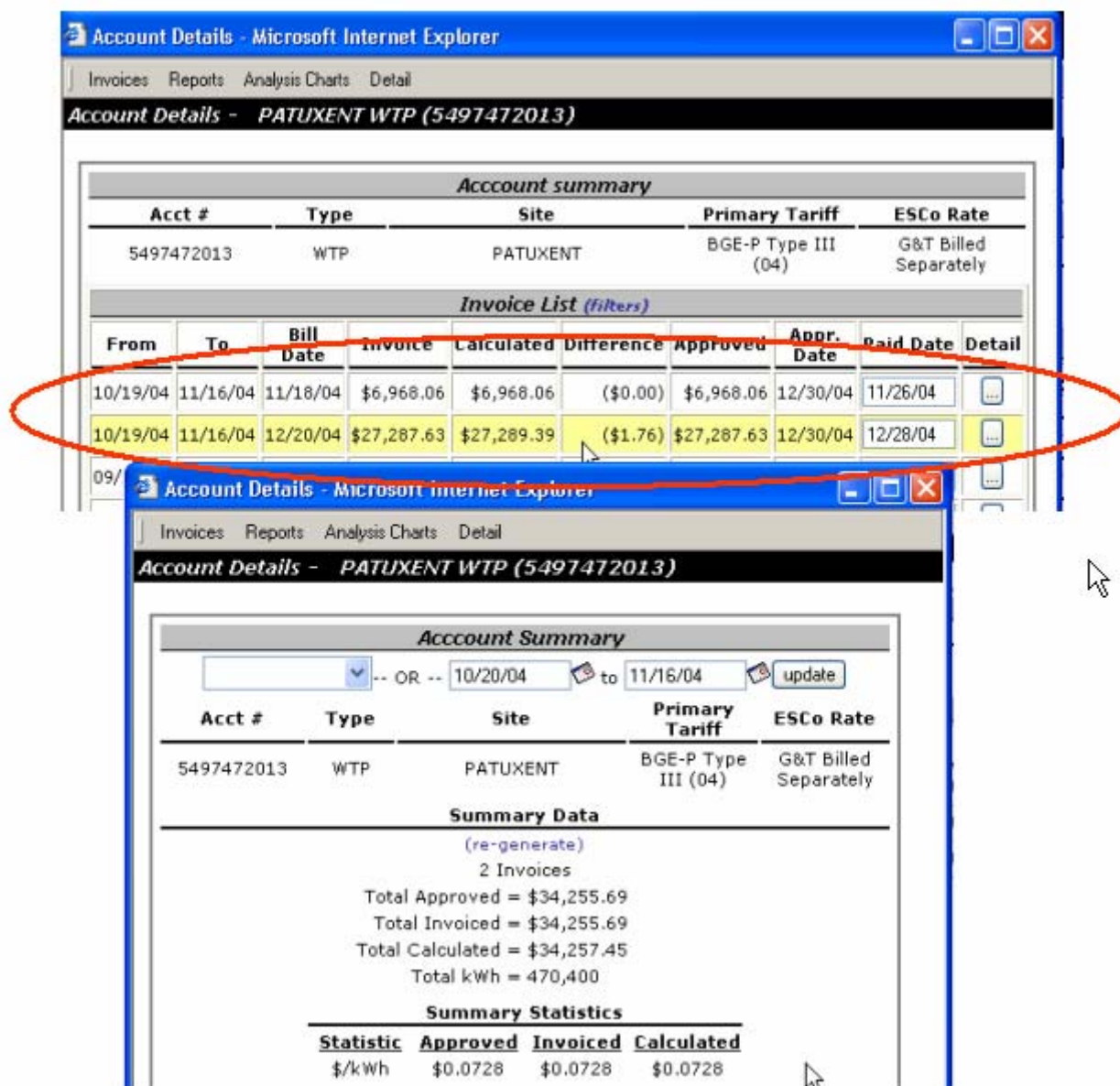


Figure 2. Distribution and Generation & Transmission Invoice types under one Facility



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Figure 3 shows an EDC invoice, which contains only distribution charges:

Invoice Verification Detail - Microsoft Internet Explorer

Detail Chart

Invoice Data

Site:	Acct Number	Invoice Type	Distribution Co.	DistCo Tariff	ESCo Rate
PATUXENT	5497472013	actual	BGE	BGE-P Type III (04)	G&T Billed Separately
Facility Type	Facility Num	Date Entered:	Billing Date:	Service From:	Service To:
WTP	1201	12/30/04	11/18/04	10/19/04	11/16/04
Description	Quantity	Units	Unit Cost	Calculated	

Distribution Components - BGE-P Type III (04)

Customer Charge	n/a	Monthly	\$750.00	\$750.00
Delivery Service (kW)	1,492	Maximum kW	\$2.33	\$3,476.36
Delivery Service (kWh)	470,400	Total kWh	\$0.004560	\$2,145.02
Franchise Tax (Delivery)	470,400	Total kWh	\$0.000620	\$291.65
Universal Service Charge- 272.10	n/a	Monthly	\$272.10	\$272.10
MD Environmental Surcharge	470,400	Total kWh	\$0.000150	\$70.56
Administrative Credit (BGE)- Type III	470,400	Total kWh	(\$0.000080)	(\$37.63)
Subtotal: Distribution				\$6,968.06

Blended rate components (G&T) - G&T Billed Separately

Generation	470,400	Total kWh	\$0.000000	\$0.00
Transmission	470,400	Total kWh	\$0.000000	\$0.00
Subtotal: Transmission & Generation				\$0.00

Summary Detailed

Approve Amount: \$6,968.06 ☐ Approved

Approve Date: 12/30/04 ☐ Flagged

Comment:

Total Calculated Amount:

\$6,968.06

Actual Invoice Amount:

\$6,968.06

Discrepancy Amount:

(\$0.00)

Save Delete



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Figure 3. EDC Invoice with only Distribution Charges

Figure 4 shows the invoice from the energy supplier for the corresponding period, which contains only energy and transmission related charges.

ESCO Invoice Detail - Microsoft Internet Explorer

Invoice Detail

Invoice Date: **12/20/04**
Payment Due Date: **01/04/05**
Purchase Order: **P60467**
Contract: **3223- Phase IIC**
Service Location: **PATUXENT, WTP**
Facility Code: **1201**
EDC: **BGE**
EDC Account #: **5497472013**
Billing Period From: **10/19/04**
Billing Period To: **11/16/04**

Cost Components	CES Invoice	EIS Calculated
EDC Metered Usage:	470,400	470,400
Sum of Hourly Usage:	470,391	-
Energy (kWh) Charges:	\$22,617.70	\$22,619.45
Capacity (kW) Charges:	\$764.43	\$764.45
Transmission (kW) Charges:	\$838.50	\$838.50
Ancillary Charges:	\$1,034.87	\$1,034.87
Service fees:		
Retail Electric Services:	\$940.80	\$940.80
Electric Procurement Services:	\$235.20	\$235.20
Active Supply Mgmt Services:	\$856.13	\$856.13
Total Charges:	\$27,287.63	\$27,289.39
\$/kWh:	\$0.05801	\$0.05801

Approve Amount: ☒ Approved
Approve Date: ☐ Flagged

Figure 4. ESCO Invoice containing only energy and transmission charges.

Advanced Electrical Metering

Utilizing utility tariffs that allow electricity customers to upgrade monthly read meters, WSSC has initiated a program to upgrade non-interval and monthly read meters with advanced meters that allow the utility (Pepco, BGE, and Allegheny) to collect metered information via a telephone/cellular phone network. The data is collected and stored weekly, thereby increasing data reliability. The data, kWh and kVAh, within the meter is kept in 15 minute increments, based on full, quarter, half, and three-quarter hours. Hourly data is



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made

available to WSSC through a web-based as well as through our own SCADA system. The accounts with advanced metering can be added to the block kWh and capacity bid on the wholesale market, as well as supplying our planned water distribution system energy optimization program with the data it needs to control pump schedules. During FY'04-FY'05, WSSC contracted with BGE and Allegheny to replace 8 new meters at GL and PH account locations. Currently underway is the replacement of 17 Pepco meters at various FO, WPS, and WWPS locations. All meters should be upgraded by the end of FY'05.

Real-Time Metering Data

We are entering the 3rd year of a continuing program to link WSSC's major electric (billing) meters into our SCADA system, then electronically to EIS. This will enable plant superintendents, operators, and other supervisory personnel to monitor power demand (kW) as it occurs and adjust equipment operations accordingly to optimize electricity costs. Currently, we have 12 main electric meters linked to SCADA; this will be tied to EIS so that invoice cost and consumption will be able to be verified immediately at the meter reading date. The information gathered will be used to select optimum supply pricing options, provide real-time demand aggregating, provide capability of on-site energy management, and verify electric utility meter readings for faster and more accurate cost tracking. This programming work will be accomplished under Phase IIC of the on-going Energy Performance Project, and implemented during FY'05-'06.

Energy Performance Program

Phase IIA:

Constellation Energy Projects and Services Group (CEPSG), formerly Constellation Energy Source (CES) is completing construction work on a \$10 million capital energy efficient upgrade of aeration, solids handling, grit removal, peak shaving electric generation, HVAC modifications, and variable speed drives at Western Branch, Parkway, Piscataway, Damascus, and RGHB. This energy performance project is the first of its kind at WSSC, combining design, construction, monitoring, energy guarantee, and maintenance, into one project. The energy and energy related savings resulting from the installation - approximately \$750,000/yr. - will pay for 100% of the capital funds required over a 15-year period. CES and WSSC will monitor the performance of the new equipment to insure that the projected savings will be met. WSSC is receiving a low-interest (1.2-%) loan from MDE for this project. WSSC has been realizing energy savings at Western Branch, Piscataway, Parkway and RGHB since January 2004. Construction is substantially completed and only the commissioning/startup of the solids upgrade system at Parkway and modifications to the new grit removal system at Western Branch remains to be completed.

Phase IIB:

CES and their engineering subconsultants have completed the investigation of all major WSSC water pumping stations, Potomac, and Patuxent water treatment plants, selected wastewater pumping stations, major field offices, and Western Branch under Phase IB (feasibility study), and are preparing their final proposal for equipment and controls upgrades at these facilities. The proposal will include 30% design, construction, annual energy guarantee, monitoring & verification, and maintenance, with a payback of 10-15 years. Upgrades being proposed included:

- electric peak shaving at Seneca WWTP
- biosolids incinerator upgrades at Western Branch WWTP
- pumping upgrades at Anacostia II WWPS
- Water distribution system SCADA-based software system to automatically control pumping and storage



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to optimize energy costs, water quality and system demand. The system is designed to adapt to changes in real-time hourly electricity pricing to automatically adjust pump operations and tank storage levels and turnover rates.

Preliminary proposals for Phase IIB (design, build, provide energy guarantee, maintain, monitor and verify savings over a long-term period) were received in November- December 2004, and have been reviewed by WSSC and our consultant, JMT. Technical review meetings with CEPSC are scheduled to begin in mid-January 2005. Final scope of work, level of detail, pricing for Phase IIB is expected to be finalized in March-April 2005, with Commission approval and start of project by June 2005. Estimated guaranteed annual electricity and natural gas savings are \$1,000,000, with approximate capital cost of \$9,000,000.

Phase IIC: Electric Supply: Active Load Management Services

Electrical Supply- BGE and Pepco Interval Accounts

From December 2000- June 2004, WSSC purchased its electric supply through the Montgomery County Electricity buying group. However, in November 2003, WSSC decided to investigate supply procurement using the flexibility of WSSC's ability to shift and manage load as well as guaranteeing suppliers a substantial base load. In order to be in the position to take advantage of the de-regulated electricity market, the Commission granted the Energy Manager in November 2003 the authority to approve (in conjunction with the WSSC Procurement Group) energy commodity prices and contracts. This was culminated in negotiating a final agreement in March 2004 using CES (EPC- Phase IIC) under their existing Energy Performance Contract. The services included competitively bid wholesale energy and capacity supply for WSSC's interval accounts (all BGE/Pepco Type III and some Type II - approximately 93% of consumption), day ahead LMP purchasing on the PJM grid, and supply load management services. The agreement guaranteed WSSC with a minimum of 6% savings compared to the utilities' POLR, and flexibility to take advantage of volatile electric markets quickly to lock in savings. CES's efforts will tie together existing WSSC initiatives such as energy conservation with new real time load management programs such as water system optimization and utilization of back-up generation to reduce WSSC energy costs and minimize financial risks. Using a prequalified wholesale bidder list of 14 suppliers, bids were taken twice in May 04 before final prices were accepted for FY'05, on 5/18/04. Estimated savings for FY'05 are \$1.6 million compared with POLR/SOS. To date (through November 2004) savings have been \$860,000 compared to SOS. This includes the costs of active supply management, procurement, retail services, consulting, and EIS programming services.

A major reason for our ability to shift load is the Potomac Water Treatment Plant's major impact on the system. Figure 5 illustrates the load shifting of approximately 5 MW during a typical day of the week 8/29/04- 9/4/04. The drop in load occurs generally during higher priced PJM-LMP hours 11 a.m.- 8 p.m. Figure 6 shows a daily load shifting under a winter price scenario.



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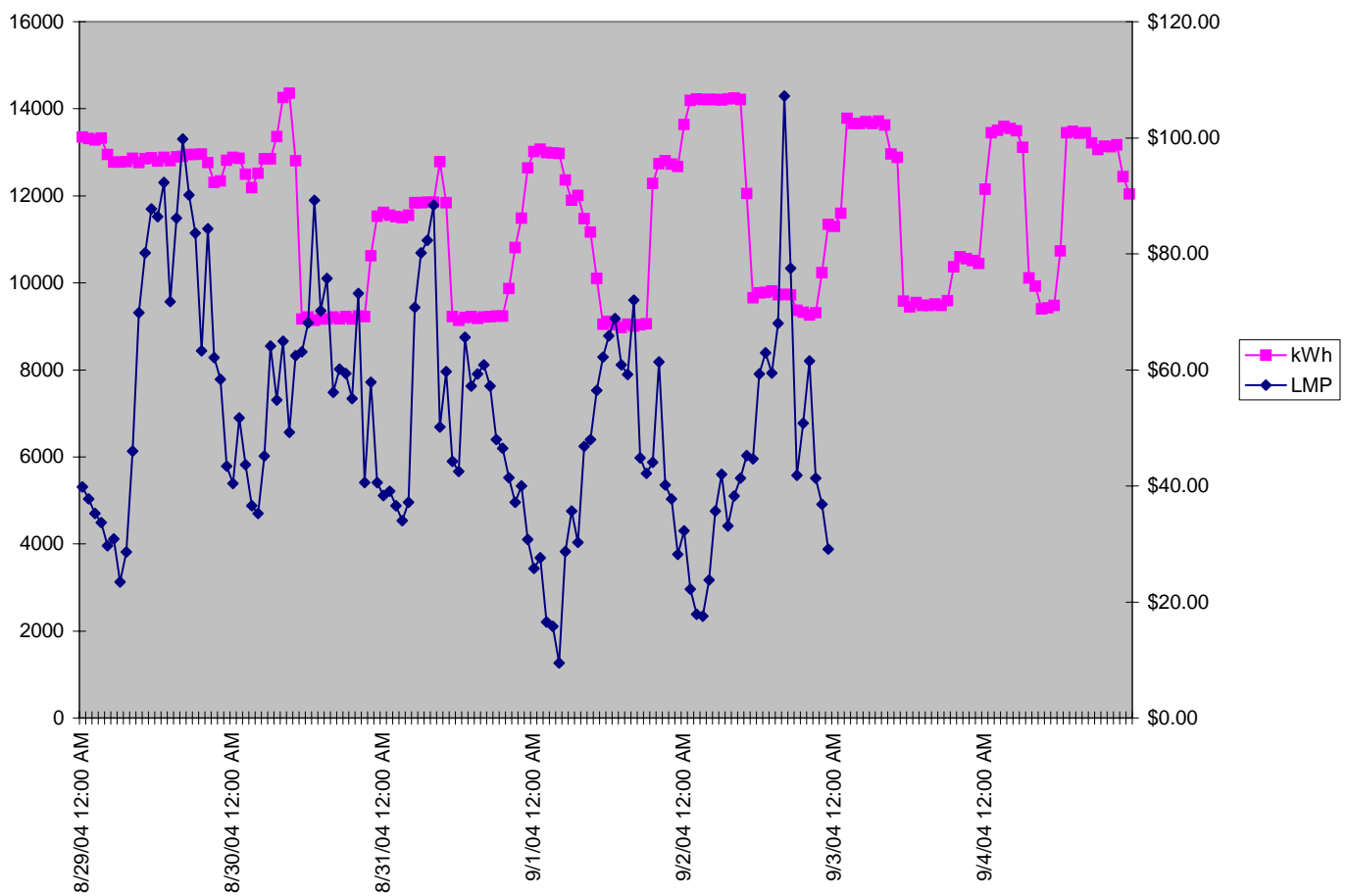


Figure 5: Potomac Load vs. LMP: Week of 8/29/04- 9/04/04



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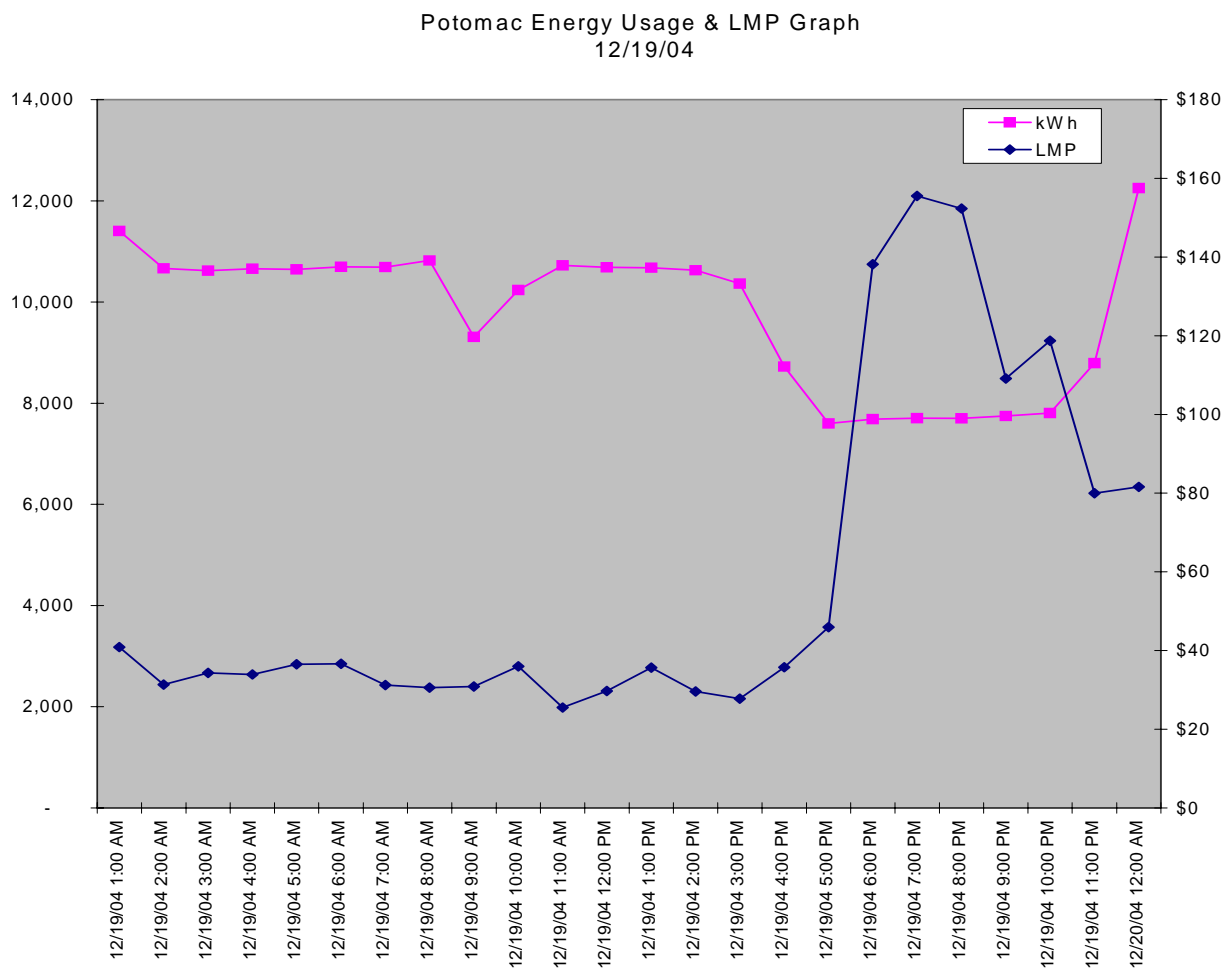


Figure 6: Potomac Load vs. LMP 12/19/04



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Turbine Operation

Due to the significant amount of rainfall this year and the corresponding high water level at Rocky Gorge Reservoir (currently at normal level), the Rocky Gorge Water Pumping Station, pump turbines (700 HP each) ran a total of 8612 hours in FY'04, saving \$226,000 in electricity costs. The turbines are run in lieu of electric motors when the reservoir level permits. As a comparison, in FY'03, due to lower rainfall, the three turbines operated a total of 5960 hours avoiding \$156,500 in electrical costs.



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	<u>FY'03 ACTUAL</u>	<u>FY'04 ACTUAL</u>	<u>FY'05 BUDGET</u>	<u>FY'06 REQUEST</u>
WSSC ENERGY BUDGET	\$11,421,902	\$11,713,012	\$14,982,000	\$17,338,000

ENERGY BUDGET ANALYSIS:

Workyears

No authorized work years are included. An Administrative Assistant II has assisted the Energy Manager in processing all individual utility bills into EIS for payment, interfaces with Disbursements, and with utilities to correct billing errors, adjustments to insure timely and accurate payment. The Energy Manager performs data analysis and verification, contract negotiations with utilities and suppliers, management of the development of the EIS and Energy Performance projects, installation of interval meters/pulses, real-time metering interface with SCADA. In addition, the Energy Manager works with Plant Superintendents and Depot managers to implement energy saving capital projects, load curtailments, and other demand side optimization projects.

Electricity Market

a) BGE and Pepco took wholesale bids in February and March 2004 for the new fixed price POLR (Provider of Last Resort) rates, starting in 7/1/04. For large Type III accounts (over 600 kW peak demand), the new fixed price POLR will expire 5/31/05, at which time all large commercial and industrial customers will be forced to buy a 3rd party. For medium Type II accounts (less than 600 but higher than 25 kW peak demand), POLR expires 5/31/06, but will be rebid for the 7/1/05-5/31/06 period. Since the BGE/Pepco POLR bids were taken in Feb/March 04, electricity market prices have increased, held up partially due to the run up in natural gas. Due to these higher prices, many customers have opted to stay with the new POLR rates for Type I and II accounts (less than 600 kW peak demand). New POLR rates are cheaper than market bid rates. For large (Type III) accounts, the new BGE and Pepco POLR supply rates are 55-65% higher than the old (pre-7/1/04) SOS rates. Although WSSC's new supply procurement strategy is projected to save \$1.6 million over POLR rates in the first year (FY'06), the increase in the FY'06 request over the FY'05 budget is primarily due to higher electricity market forces.

b) Electrical Supply- BGE Accounts

The Pepco Energy Services (PES) supply contract for BGE P accounts -Patuxent, Parkway, Rocky Gorge, and RGHB- expired in June 2004. BGE SOS for GL (Type II) and G (Type I) accounts expired on 6/30/04. All the G accounts (29) are now under BGE's new POLR rates which are currently priced less than the market. Our G accounts are most likely to remain on POLR throughout FY'06. POLR-Type I rates expire in 5/31/08, Type II rates expire in 5/31/06. Supply for GL accounts (5) are being purchased under our interval meter block load and day ahead wholesale bidding methodology (see "d" below).



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c) Electrical Supply: Pepco Accounts (non-interval)

The original de-regulated supply contract with Washington Gas Energy Services, initiated in December 2000, expired in June 2004. In conjunction with The Montgomery County Task Force on Electrical Procurement, the contract has saved WSSC over \$600,000 (compared to Pepco's SOS rates) since its inception. All Pepco GS accounts (100) are now under Pepco's new POLR rates which are currently priced less than the market. GS accounts are most likely to remain on POLR throughout FY'06. Supply for the smallest Pepco MGT accounts (14) also is being purchased under Type II POLR rates, expected to be the most economical choice throughout FY'06. Supply for the remaining 15 MGT accounts will be purchased under our interval meter block load and day ahead wholesale bidding methodology.

d) Electrical Supply: Allegheny and SMECO Accounts (non-interval)

Standard Offers for Allegheny and SMECO accounts expired on 12/31/04. Allegheny and SMECO solicited and received offers on partial blocks of energy starting in July 2004, spreading their risk and mitigating the effects of a volatile summer market. After the new Allegheny and SMECO rates were announced in November and December 2004 and undertaking a thorough analysis, it was determined that WSSC supply for all Allegheny and SMECO accounts would remain on new fixed price POLR rates through CY 2005 since market rates remain higher than POLR service.

e) Wind Power

An estimated \$.015/kWh premium for the purchasing of 5% wind power was added starting July 04. For the purpose of purchasing renewable energy, WSSC, along with Prince George's County Government, participated in the Montgomery County Electric Aggregation procurement for wind power. The premium for FY'05 will be \$157,000/yr., and the same premium was used for FY'06.

Natural Gas Market

WSSC has been purchasing natural gas since 2001 through a joint contract managed by Montgomery College. This has enabled WSSC to mitigate wild price fluctuations experienced in the spot market by locking in competitive rates on either a monthly or yearly NYMEX basis. Since 2003, increasing power plant demand, decreasing drilling productivity, and volatility in the Middle East, market pricing has remained high. Although gas storage is also at an all-time high, we expect pricing mitigate somewhat for FY'06, compared to FY'04. However, FY'05 projected prices are substantially higher than FY'04, and are expected to stay in the \$5-\$6/decatherm (commodity) for the next few years.

Montgomery County Energy Tax

Increase in the Montgomery County Energy Tax from \$.0028/kWh (ending 6/30/03) to \$.0129/kWh (effective 7/1/04) in the last two years has resulted in higher cost per unit of electricity consumption at all sites located in Montgomery County. This translates into an increase in overall WSSC energy costs by \$1.1 million/year.



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Operational Changes affecting FY'06:

Project	Description	Cost Effect
Seneca WWTP Expansion	5-mgd plant was expanded to 11-mgd production in November 2004 with the completion of the new plant. The timing of the further expansion to 17.4-mgd depends on the completion date of the new Lower Seneca Basin Sewer, expected to be FY'06. Larger Seneca WWTP will cause electric demand slightly due to greater efficiency of new 2-stage blowers, use of fine bubble diffusers, and more efficient solids handling equipment.	Increase
Energy Performance Project Upgrades	Installation of more efficient fine bubble diffusers and smaller, VFD driven blowers (estimated final completion in November 2004) at Western Branch and Parkway WWTP have reduced electric consumption and demand.	Decrease



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Basis for Energy Consumption and Cost Projections (see attached spreadsheets)

Energy consumption and cost projections are based on WSSC- MOST FY'04 historical data and workload indices for the FY'06 Program/Budget.

Historical Data	FY '00 Actual	FY 01 Actual	FY '02 Actual	FY '03 Actual	FY '04 Actual	FY '05 Projected	FY '06 Projected
Field Office (SF)	559,133	559,133	559,133	559,133	559,133	559,133	509,133
Water Treated (MG)	59,714	60,189	59,605	60,737	61,089	61,320	61,138
Water Pumped- Boosted (MG)	14,886	19,021	13,295	12,174	13,626	13,678	13,637
Waste Water Pumped (MG)	33,220	32,534	30,765	37,017	37,464	37,772	37,829
Waste Water Treated (MG)	18,852	18,866	17,270	20,486	22,891	25,309	25,638

FY'06 Electric Rates

FY'06 WSSC electric rates estimated to be 50% higher than actual FY'04 rates, due to the following:

- Prices have been kept artificially frozen for the last 5 years (Standard Offer Service) mandated by the Public Service Commission as a condition of electric deregulation. During that time (most dramatically since October 2003), the real-time electricity market has increased substantially, due to the run-up of natural gas and crude oil. The 5-year SOS for BGE and Pepco (comprising about 90% of WSSC's electricity usage) expired on 6/30/04.
- New BGE and Pepco POLR supply rates are 60%-70% higher than the old price-freeze rates.
- Montgomery County has increased its Energy Tax rate from \$.0028/kWh (ending 6/30/03) to \$.0129/kWh (effective 7/1/04) in the last two years. This alone accounts for a 20% increase in electric rates for accounts located in Montgomery County, approximately 10% rate increase over all WSSC accounts.
- Wholesale forward market energy prices are currently trading at approximately 8% above May 04 prices (when original blocks were purchased by WSSC/CES). Taking into account line losses, CES markup, and distribution costs, it is reasonable to expect an overall increase of 5% for FY'06 prices over FY'05.
- As part of our agreement to purchase 5% of our electricity with wind power starting in FY'05, our electricity cost for this premium is \$157,000 higher in FY'05 and beyond.
- Without our new hourly pricing procurement strategy accompanied by managed load shifting, our rates would be 60%-70% higher- close to POLR rates by the utilities. We are saving approximately \$.01/kWh by buying under this strategy.



**WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2006
RESOURCE CONSERVATION PLAN**

FY'06 Natural Gas Rates

FY'06 WSSC natural gas rates are estimated to be 25% higher than actual FY'04 rates, due to the following:

- The increased use of natural gas for electric generation, high demand for natural gas in a variety of industrial applications and U.S. expanding economy
- Reduced efficiency of natural gas drilling, 20% of drilling rigs out of operation due to September 2004 hurricane damage in the Gulf of Mexico.
- High crude oil prices and continued instability in the Middle East. This is the major reason electricity prices have risen so high within the last year.

Water Pumped, Treated, Waste Water Pumped, Treated:

Historical (FY'00- FY'04) kWh/MG indices have been applied to projected flows to determine projected FY'06 kWh; kWh were adjusted for changes in efficiency and operational changes including the effect of EPC Phase IIA on Parkway, Piscataway and Western Branch WWTP; \$/kWh projected rates for FY'06 were based on current rates experienced under CES contract, then applied to each category of facilities (WTP, WWTP, WPS, etc.) to estimate total projected cost.

Field Offices:

Historical kWh/SF indices have been applied to projected SF to determine projected FY'06 kWh; SF was adjusted for FY'06 by eliminating Hyattsville FO; kWh were adjusted for changes in efficiency; \$/kWh projected rates for FY'06 were based on new POLR rates from Pepco and BGE, and applied to total SF to estimate total cost.

Dams, WWMVs, PRVs and Tanks:

Electric consumption was projected based on kWh 3-5 year historical averages; kWh total was applied to projected \$/kWh POLR rates to estimate total cost.



**MONTGOMERY
COLLEGE**

RESOURCE CONSERVATION PLAN

FY 2006



Takoma Park & Germantown Solar Energy Installations

**Prepared
By
The Office of Facilities
January 2005**

EXECUTIVE SUMMARY

This Resource Conservation Plan (RCP) is prepared by the Montgomery College Office of Facilities, to support the College's FY 2006 Energy Management Capital Improvements Program (CIP) and Utility Operating Budget requests for funding.

This document describes the Montgomery College energy organization, discusses energy consumption, and summarizes resource conservation program accomplishments and plans. Tables present information on historical utility consumption and utility budget estimates. The Capital Improvements Program (CIP) Project Description Forms (PDF) that impact the College Energy Management are also contained in this document.

In FY 2005, the Energy Management Program focused on the energy efficient design of the Takoma Park Campus expansion. This includes the construction and commissioning of the new 111,000 Gross Square Foot(GSF) Student Services Center(SSC) and East Campus Central Plant which will be opening in January 2006 and which incorporate the latest energy efficiency technologies. Design began in FY 2005 for the King Street Art Center and West Campus Central Plant. In FY 2004 the College incorporated Green Building design requirements into programming documents with the intent to obtain at least a LEED Silver Rating for all new construction projects.

In FY 2005, the College again participated in the joint procurement of deregulated utility supplies of electricity and natural gas and 5% of the College's electricity is being generated from wind power. In support of the recently completed College Master Plans, the College began updating Utility Master Plans for all three campuses. In FY 2004 the College became a member of the County sponsored Environmental Policy Implementation Task Force(EPITF), assisted in the development of the Environmental Issues and Action Report, and prepared an Environmental Action Plan.

Montgomery College is requesting \$125,000 for the FY 2006 College Energy Management Capital Improvements Program(CIP) for various energy retrofits, and new energy programs. An additional \$125,000 is requested for the FY 2006 operating budget that funds one energy staff position and other operating budget energy projects. This request is the same as in past fiscal years. The FY 2006 utility operating budget request is \$4,310,468, a 46.7% increase over the FY 2005 request, primarily due to increased unit costs.

Montgomery College is dedicated to implementing and maintaining a life cycle cost-effective, low-risk energy management program. Although all energy conservation and environmentally friendly opportunities are considered, only those opportunities which are of the appropriate level of technology, have a high probability of success and meet the lowest net present value criteria will be implemented. To ensure that the Resource Conservation Program is operating as predicted, the appropriate databases are maintained. The goal of the program is to provide safe, comfortable, economical and environmentally friendly facilities, which will enhance the learning environment and contribute to student success at Montgomery College.

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Energy Conservation CIP, No. 816611, PDF

Planned Lifecycle Asset Replacement CIP, No. 926659, PDF

Takoma Park Central Plant, CIP, No. 016600, PDF

Montgomery College FY 2006, Utility Projection Report, November 22, 2004

ICEUM Utility Rates, FY05&FY06, September 28, 2004

GENERAL INFORMATION

Montgomery College was founded in 1946 and established its first campus in Takoma Park in 1950. Since then the College has grown rapidly, adding a second campus at Rockville in 1965 and a third campus in Germantown in 1976. The College operates a total of 46 buildings in excess of 1.7 million gross square feet (GSF), on the three campuses with additional off campus leased space. The buildings consist of classrooms, offices, laboratories, libraries, meeting rooms, gymnasiums, child care centers, natatoria and greenhouses. In addition to the programs offered at each campus, the College offers regular college credit programs and non-credit courses in off-campus locations throughout the County. Classes are held in campus facilities seven (7) days a week. The hours of use are generally from 7:00 a.m. until 11:00 p.m. on weekdays, and at various times during the day on Saturdays and Sundays. Some evening classes are held on Saturday or Sunday, but there are frequently intramural and varsity activities in the Physical Education buildings as well as community use (rentals) of other spaces on the weekends. The College's computer center is located on the Rockville Campus and is operational 24 hours a day. Classes are in session during the summer at all three campuses. The College's administrative and academic offices are open year-round. Central plants on the Rockville and Germantown campus distribute heating and cooling water for environmental conditioning of the spaces.

Montgomery College began its resource conservation program prior to the oil embargo in 1973, is a charter member of the Interagency Committee on Energy and Utility Management (ICEUM), and has submitted a Resource Conservation Plan in support of the utility operating budget since January 1976. The Office of Facilities is responsible implementing the Resource Conservation Plan. The College has been a member of the Electricity Deregulation Task Force, has participated with other agencies in the joint procurement of the Electricity Supply and is the lead agency for the joint procurement of natural gas supply. In FY2004, the College joined other County agencies in forming the Environmental Policy Implementation Task Force (EPITF) and assisted in producing the first Environmental Policy Issues and Action Report.

ENERGY & ENVIRONMENT ORGANIZATION

The Office of Facilities, under the direction of Mr. David J. Capp, provides college-wide support services for all three campuses and the central administration of the College, and is responsible for those activities associated with energy use, energy conservation planning, energy management and environmental issues. In February 1987, Montgomery College hired an Energy Manager who reports directly to the Chief Facilities Officer, and is responsible for implementing the energy components of the Resource Conservation Plan. See Figure 1.

**Office of Facilities
Energy Organization Chart**

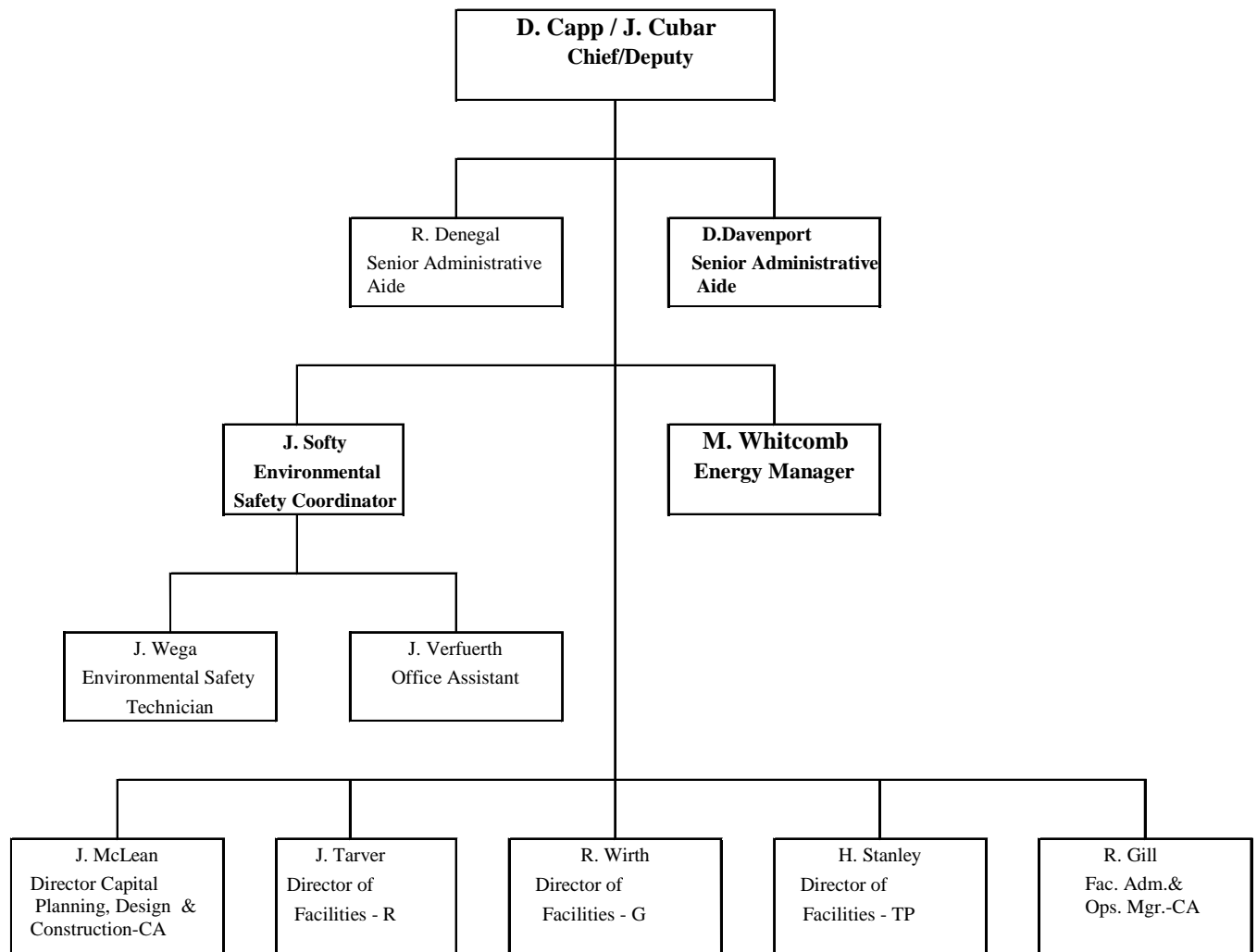


Figure 1

The Energy Manager coordinates energy efficient design of new and renovated buildings with the Director Capital Planning, Design and Construction, and coordinates energy audits, Utilities Master Plans and retrofits with the three Campus Directors for Physical Plant, and the Administrative Services Manager, Central Administration. The Energy Manager also coordinates with the Deputy Chief's, Senior Administrative Aide on matters relating to utility bills and the utility bill accounting database. In FY 2005, the College contracted consultant services to provide assistance with utility deregulation issues.

The College maintains a vehicle fleet to support the functions of the various College departments. In addition to road vehicles, the College maintains various vehicles such as mowers, tractors and powered carts. The Director of Facilities, Germantown is responsible for College-wide maintenance support of these vehicles and staffs an auto maintenance shop on that campus.

The Energy Manager represents the College on the Interagency Committee on Energy and Utility Management (ICEUM), is a member of the County Deregulation Task Force and represents the College as the lead agency in the procurement of natural gas supply for the County.

ICEUM MEMBER: Mr. J. Michael Whitcomb, P.E.
Energy Manager
Central Administration
Room 315
900 Hungerford Drive
Rockville, MD 20850
Phone No. (301) 251-7375.
Fax No. (301) 251-7379
e-mail: mike.whitcomb@montgomerycollege.edu

Mr. Whitcomb has been a member of the ICEUM committee, representing various county agencies since its formation in 1983. Mr. Whitcomb has served as the Interim Chairman of ICEUM, and is a former member of the Montgomery County Citizens Energy Conservation Advisory Committee (ECAC). Mr. Whitcomb is a Registered Professional Mechanical Engineer in the State of Maryland, a Certified Energy Manager and holds a B.S. in Mechanical Engineering and a Masters in Engineering from the University of Maryland.

In FY2004 the Montgomery County Government activated the Environmental Policy Implementation Policy Task Force (EPITF) which was approved by resolution by the Montgomery County Council. The goal of the task force is to provide interagency coordination and guidance on issues impacting the environment such as energy, transportation, recycling and hazardous waste. Mr. David Capp, Chief Facilities Officer is a member of the EPITF and is supported by Mr. Mike Whitcomb and Mr. John Softy who serve on the EPITF Technical Subcommittee. Mr. Softy is the College's Environmental Safety Coordinator, responsible for College-wide safety and environmental (hazardous waste management) issues. An Environmental Action Plan was submitted in FY2004.

The College's recycling program is coordinated at the by Mr. Robert Wirth, Director of Facilities, Germantown Campus and managed by each Campus Facilities Director. Mr. Wirth prepares the Annual Recycling Report.

Resource Conservation Plan

Summary

FY 2006

The information on this page reflects the facilities owned or operated
by this agency as of Fall of FY 05(November 11, 2004)

Agency	Montgomery College		
Number of Facilities	42 Owned <u>4 Leased</u> 46 Total	Change in number of facilities	-1(TP Science Pavillion) +1(TP Health Science Center)
Total square feet	Gross (1,853,349) Net Assignable (1,112,837) Conditioned (1,410,905)	Change in total ft ²	+91,096
Average operating hrs/year	4620	Change in avg. operating hrs/year	+20
Other changes effecting energy consumption	<p>1. Information Technology: Similar to other agencies, the College continues to expand its information technology capabilities. Most classrooms are being retrofitted with Smart Instructor Work Stations(SIWS) that include computers to control electronic audio and video multi-media presentation devices. Many traditional multi-purpose classrooms are being retrofitted with computer workstations to meet the “high tech” demands of the educational programs. A traditional classroom might consume 2-3 watts/sf while the newer energy intensive classrooms might consume 2-3 times that amount. New computer equipment is more efficient and complies with the EPA’s Energy Star requirements.</p> <p>2. Expansion: The College continues to expand to meet the demands of its educational programs and to meet the needs of its student population. In FY 2001, approximately 39,000 GSF was added and approximately 175,000 GSF was added in FY 2002, This is a 14% space increase. Additionally starting in FY 2000 approximately 8 properties were purchased for demolition in FY 2002 & 2003 for the Takoma Park Campus expansion. Between FY 2004 & FY 2006, approximately 250,000 GSF(+14%) will be added to the College on the Takoma Park Campus. New and renovated buildings are required to meet strict resource conservation and green building guidelines, using the latest life-cycle cost effective technologies. A 20 year College-wide Master Plan has been prepared and is being followed by a Utilities Master Plan in order to determine the most lifecycle cost effective means of providing utility infrastructure.</p> <p>3. Competitive Procurement of Utilities: The College has joined with other County Government agencies and local municipalities to procure utilities. This initially resulted in an approximate 7% savings on electricity generation and transmission compared to the Standard Offer Service(SOS) provided by the utility, but savings were marginal for FY04. The College has been the lead agency for the joint procurement of the supply of natural gas. Energy commodity(electricity, fuel oil, & natural gas) prices remain volatile, making utility budget predictions difficult. Deregulated procurement has required additional staff</p>		

and consultant hours for procurement and verification of bills. Approximately 15% additional man-hours are required for this effort.

4. New and Renovated Building Design: The College continues to improve and refine the energy efficient design process to meet the requirements of the Montgomery County Code. The College has developed Energy Design Guidelines specifically tailored to the needs of the College's design and project management teams. All buildings undergo rigorous analysis during the design process which results in an estimated 40% reduction in energy and maintenance costs. Efficiently designed buildings are no more costly to design and build than inefficient buildings. Sustainable and renewable technologies are incorporated into all building designs. Commissioning ensures that buildings are built to the specifications and are turned over to the operations and maintenance staffs in proper operating order. Small scope alterations and renovations are also scrutinized for energy opportunities. Based upon the evaluation criteria established by the U.S. Green Building Council Leadership in Energy and Environmental Design(LEED), the College has established a goal of all future buildings attaining at least a LEED Silver Certification.

5. Utility Master Planning and Central Plant Technology: The recommendations of utility master plans continue to be implemented on the three campuses. Highly efficient central plant technology has been implemented on the Rockville and Germantown buildings and are proving more cost effective in light of the condition of aging building equipment and deregulated utility pricing. A new central plant and distribution system was designed in late FY 2003 for the Takoma Park Campus. The plant is being installed in the basement of the new Student Service Center. A College-wide Utility Master Plan consultant study was commissioned in FY2005 in response to the recently completed College-wide Master Plan. Utility Master Planning is a lifecycle cost effective method of determining the optimum development of utility infrastructure, particularly for College Campus environments.

6. Building Automation Controls and BACnet System Integration: Standardization of communications protocols(BACnet) by the American Society of Heating, Refrigeration and Air Conditioning Engineers(ASHRAE) and acceptance by the engineering and manufacturing community has resulted in building control system integration capabilities and open competition. Integration also allows communications between building system components through the building automation system which increases capabilities while reducing costs. These systems are also capable of communicating over existing building networks, which eliminates redundant networks and further reduces costs. The College has introduced this technology on all three campuses and is incorporating it into all new building designs.

7. Recycling and Hazardous Waste Disposal: The College has an active recycling and hazardous waste disposal program. The results of the recycling program for FY 2004 are reported in the summary sheets.

8. Vehicle Fleet: The College maintains approximately 50 vehicles to support the various functions of the College. The fleet is maintained by the Director of Facilities on the Germantown Campus. These vehicles are described on the summary sheets. The College also maintains various other specialty vehicles, such as mower, tractors, forklifts and carts. These are not included in the summary sheets.

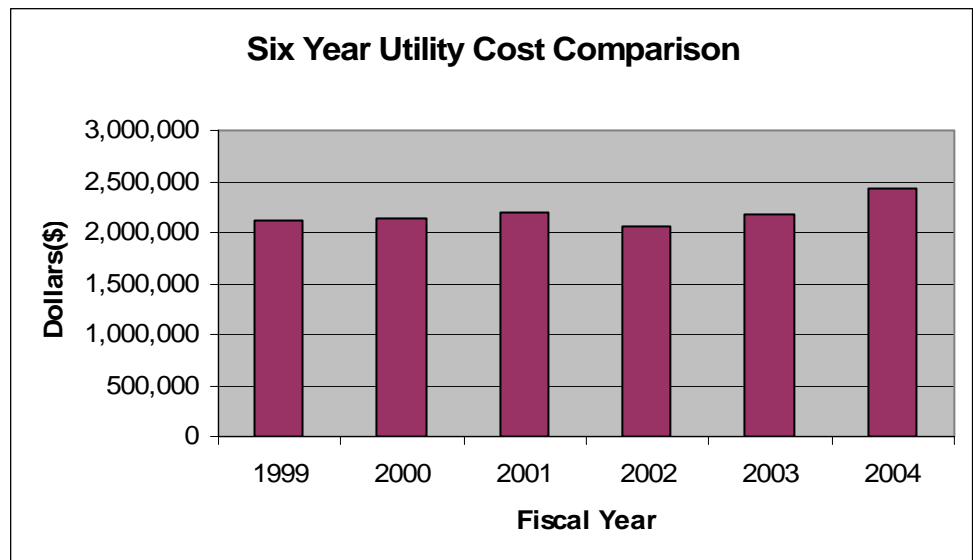
9. Capital Improvement Projects - The College Resource Conservation Program

projects are funded primarily by three Capital Improvement Projects(CIP), Energy Conservation(No. 816611), Planned Lifecycle Asset Replacement(No. 926659) and Takoma Park Central Plant(No. 016600). The Resource Conservation Program does however influence decisions made in all capital and operating projects that involve the consumption of resources by the College community. \$125,000 for staff salary and energy projects is included in the operating budget.

10. Renewable Solar Energy: The College currently has 83 kW of solar photovoltaic electric capacity and a 900 evacuated tube solar thermal array. These generate approximately 160,000 kWh of electricity and 183,960 kWh of thermal energy saving the College approximately \$25,000 annually.

11. Utility Management Databases; The College continues to monitor utility expenditures and maintain utility consumption databases. This activity has proved valuable since the recent deregulation and resulting competitive procurement of electricity and natural gas has resulted in numerous billing errors. Timely monitoring and accurate records has allowed resolution of disputes with suppliers. Due to the increase quantity and complexity of billing issues since deregulation, the College has obtained consultant services to assist in billing monitoring and resolution. Accurate records and monthly monitoring also provide early warnings of unusual operating conditions that result in changes to utility consumption.

The chart below shows the College-wide utility cost comparison for the past six fiscal years. Last years increased cost was due primarily to increases in the unit costs for electricity, natural gas and the phase-out of refunds from the deregulated sale of the utility generating assets.



College Utility Consumption & Cost Comparison(FY03-FY04)

Utilities	Total Consumption Actual FY 04	Consumption Percent Change From Actual FY 03	Total Cost Actual FY 04	Cost Percent Change From Actual FY 03
Electricity	26,474,982 kWh	-1.58%	\$1,798,698	+7.76%
Firm Natural Gas	155,377 therms	+4.9%	\$162,936	+51.1%
Interruptible Rate Natural Gas	406,098 therms	-4.5%	\$335,400	+38.0%
Utilities	Total Consumption Actual FY 04	Consumption Percent Change From Actual FY 03	Total Cost Actual FY 04	Cost Percent Change From Actual FY 03
Fuel Oil #2	31,080 gal.	-24.2%	\$34,312	-14.4%
Propane	3,500 gal	+15.6%	\$4,200	-35.6%
Water	16,163 kgal	-27.3%	\$50,462	-14.5%
Sewer	11,282 kgal	-29.3	\$51,285	-22.2
Total			\$2,437,293	+11.5%

New Measures

This table shows information on resource conservation measures implemented during FY 05
(July 1, 2004 through June 30, 2005)

Measures	Date Implemented (mo/yr)	Initial Cost (\$)	Annual Net Impact On Maintenance Cost (\$)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cost Savings (\$)
Capital Improvement Projects:						
Lighting	Various	50,000	(2,000)	Elect.	125,000	9,000
HVAC	Various	50,000	(2,500)	Elect., N.Gas & Fuel Oil	50,000 kWh, 5000 Th	3,500 4,500
Controls	Various	25,000	(2,000)	Elect.N.Gas & Fuel Oil	25,000 kWh 5000 Th	2,000 4,500
Total		125,000	(6,500)			23,500
Operations and Maintenance:						
Total						
Description of Activities:						
New measures consist of Lighting, HVAC & Controls, New Building and Renovated Building Design and Central Plant Technologies that reduce energy cost, reduce energy consumption and reduce maintenance costs.						

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 04
(FY98 TOFY04)

Measures	Date Implemented (mo/yr)	Initial Cost (\$)	Annual Net Impact On Maintenance Cost (\$)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cost Savings (\$)
Capital Improvement Projects:						
Lighting	Various	200,000	(4,500)	Electricity	627,500 kWh	64,000
HVAC & Controls	Various	630,000	(9,300)	Elect., N. Gas & Fuel Oil	475,000 kWh 14,575 therms	36,000 10,330
New Building Design	Various	600,000	(15,000)	Elect., N. Gas & Fuel Oil	730,000 kWh 25,000 therms	51,000 16,000
Central Plant Technology	Various	400,000	(10,000)	Elect., N. Gas & Fuel Oil	714,000 kWh 15,000 therms	50,000 10,000
Total		1,830,000			2,371,500 kWh 49,575 Th	237,330
Operations and Maintenance:						
N/A						
Total		N/A			N/A	N/A
Description of Activities:						
Existing measures consist of Lighting, HVAC & Controls, New Building and Renovated Building Design and Central Plant Technologies that reduce energy cost, reduce energy consumption and reduce maintenance costs.						

Planned Measures

This table shows information on resource conservation measures planned
to be implemented in FY 06 (July 1, 2005 through June 30, 2006)

Measures	Date Implemented (mo/yr)	Initial Cost (\$)	Annual Net Impact On Maintenance Cost (\$)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cost Savings (\$)
Capital Improvement Projects:						
Tech Center Retrofit Lighting, HVAC & Controls	June 2005	200,000	(8,000)	Elect., N.Gas & Fuel Oil	150,000 kWh 7200 Th	15,000 5,000
Total		200,000	(8000)			20,000
Operations and Maintenance:						
N/A						
Total		N/A	N/A			N/A
Description of Activities:						
<p>The Technical Center on the Rockville Campus was renovated in the late 1980s with energy technology of the era. New lighting, HVAC and controls technology now available will provide energy and maintenance savings while improving occupant comfort.</p> <p>Utility Master Planning – To support the utility requirements for the College wide expansion described in the College’s Master Plan submitted in the Spring of FY2004, the College has commissioned an update to the College’s 1991 Utility Master Plan. Utility Master Planning is a useful planning tool which provides life cycle cost effective recommendations for supplying utilities and central plant infrastructure to campus environments.</p>						

Summary Page - Vehicle Fleet

Vehicle Type or Vehicle Group (other than AFVs) Existing Fleet During FY04	No. of Vehicles	Type of Fuel	Units	Total Units per Year	Cost per Unit	Total VMT per Year
Trucks	22	Unleaded	Gals	3700	\$ 1.69	63,000
Vans	27	Unleaded	Gals	3900	\$ 1.69	66,000
Dump Truck	1	Diesel	Gals	118	\$ 1.50	2,000
Car	1	Unleaded	Gals	1180	\$ 1.80	20,000

Changes in Vehicle Fleet From FY03 to FY04

New Vehicles Purchased	No. of Vehicles	Fuel Type	Units	Expected Average Units per Year	Expected Average VMT per Year
Vans	4	Unleaded	Gals	600	10,000
Car	0	Unleaded	Gals	2000	20,000
Truck	2	Unleaded	Gals	500	3700
Old Vehicles Retired	No. of Vehicles	Fuel type	Units	Average Units per Year	Average VMT per Year
Vans	2	Unleaded	Gals	2000	20,000
Car	0	Unleaded	Gals	2000	20,000
Truck	1	Unleaded	Gals	400	3700
AFVs Purchased	Type or Group	Fuel Type	Units	Expected Average Units per Year	Expected Average VMT per Year
N/A					

Summary Page - Solid Waste & Recycling*

Waste Type	Quantity Collected (pounds/yr)	% of Total
Corrugated Cardboard	31,270	1.4
Co-mingled Containers	25,572	1.2
Co-mingled Paper/Cardboard	422,842	19.3
Yard Waste	566,000	25.8
Solid Waste For Disposal	1,147,488	52.3
Total	2,193,172	100

Summary Page – Other Recycling*

Waste Type	Quantity Collected (per yr.)	% of Total
Motor Oil	5,520 Pounds	100
Anti-Freeze	1,720Pounds	100
Auto Batteries & Power Supplies	55 each	100
Fluorescent Light Tubes	1,450 Pounds	100
Scrap Metal	8,670 Pounds	100
Computer Equipment	86,337 Pounds **	100

* Based upon January 2004 Annual Recycling Report for Calendar Year 2003.

** Based on February 23, 2004 letter to Division of Solid Waste.

CONCLUSIONS

The FY 2006 Montgomery College Resource Conservation Program is a well-balanced, environmentally friendly, low risk, high return on investment program, based upon results of Master Planning and Energy Audit efforts. All investments are selected based upon their life cycle cost effectiveness and on their high probability for success. Utility consumption figures indicate that energy conservation measures implemented have had a positive, cost-effective impact. The potential exists for significant savings in lighting and controls, which continue to be identified during the walk-through and detailed energy audits. All new or renovated buildings undergo rigorous analysis to determine the optimum life cycle cost effective systems and meet or exceed the requirements of the Montgomery County Building Energy Design Guidelines. It is the College's goal to attain at least the U.S. Green Building Council LEED Silver Certificate Rating on all future building designs. To ensure that the program is proceeding as predicted, various databases have been developed to provide accountability for the energy dollars spent. Future resource conservation plans will be able to itemize consumption trends and compare expenditures by category. Montgomery College is confident that the FY 2006 Resource Conservation Program will meet the goal of providing safe, reliable, environmentally friendly and economical facilities which enhance the learning environment at Montgomery College.

APPENDIX A

Energy Conservation CIP, No. 816611, PDF

Planned Lifecycle Asset Replacement CIP, No. 926659, PDF

Takoma Park Central Plant, CIP, No. 016600, PDF

Montgomery College FY 2006, Utility Projection Report, November 22, 2004

ICEUM Utility Rates, FY05&FY06, September 28, 2004

Energy Conservation: College -- No. 816611

Category
Agency
Planning Area
Relocation Impact

Montgomery College
Montgomery College
Countywide

Date Last Modified
Previous PDF Page Number
Required Adequate Public Facility

October 11, 2004
20-7 (05 App)
NO

EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY04	Rem. FY04	Total 6 Years	FY05	FY06	FY07	FY08	FY09	FY10	Beyond 6 Years
Planning, Design and Supervision	1,394	1,393	1	0	0	0	0	0	0	0	0
Land											
Site Improvements and Utilities	59	59	0	0	0	0	0	0	0	0	0
Construction	2,582	1,830	2	750	125	125	125	125	125	125	0
Other	133	130	3	0	0	0	0	0	0	0	0
Total	4,168	3,412	6	750	125	125	125	125	125	125	0

FUNDING SCHEDULE (\$000)

G.O. Bonds	2,074	1,318	6	750	125	125	125	125	125	125	0
Current Revenue:											
General	1,994	1,994	0	0	0	0	0	0	0	0	0
Federal Aid	49	49	0	0	0	0	0	0	0	0	0
State Aid	51	51	0	0	0	0	0	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT (\$000)

Maintenance				-1,140	-140	-160	-180	-200	-220	-240	0
Energy				-3,130	-385	-440	-495	-550	-600	-660	0
Program-Staff				0	0	0	0	0	0	0	0
Program-Other				0	0	0	0	0	0	0	0
Offset Revenue				0	0	0	0	0	0	0	0
Net Impact				-4,270	-525	-600	-675	-750	-820	-900	0
Workyears				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DESCRIPTION

This project provides funding to (1) continue development of a Collegewide energy management program, (2) implement life-cycle cost effective energy conservation measures based upon energy audits, and (3) review new building/renovation designs for compliance with Montgomery County Code, Ch. 8 Building Energy Performance Standards. Typical project activities include retrofits and modifications of lighting, controls, and HVAC equipment; building envelope modifications; solar energy retrofits; computer equipment for equipment control and energy-use monitoring; HVAC system evaluation/balancing studies; long-range energy/utility planning studies; central plant design plans (GT/TP); and waste management studies. Typical payback on lighting, controls, HVAC and solar energy modifications is two to five years.

JUSTIFICATION

As mandated by Ch. 8 of the County Code and supported by the College, County Council, the Interagency Committee on Energy & Utility Management (ICEUM), and the Citizens Energy Conservation Advisory Committee (ECAC), an energy cost reduction program has been developed. This program consists of energy audits performed by College staff to identify life cycle cost effective retrofits, including an aggressive lighting retrofit program.

STATUS

Continuing project. New construction and building renovation projects under review during FY05-06 include the Takoma Park Campus expansion and planning for new buildings on the Rockville and Germantown campuses. Campus utilities master plans were completed in FY90 (RV) and FY92 (TP and GT) and work is being coordinated with the outcome of the Collegewide Facilities Condition Assessment (8/02).

OTHER

The following fund transfers have been made from this project: \$21,420 to Central Plant Distribution System project (#886676) (BOT Resolution #90-102 (6/18/90)); \$70,000 to Fine Arts Renovation (#906601) (BOT Resolution #94-114 (9/19/94)), and \$7,000 to Planning, Design & Construction project (#906605) (BOT Resolution #01-153 (10/15/01)). Beginning in FY98, the portion of this project funded by County Current Revenues migrated to the College's Operating Budget. It is anticipated that migration of this portion of the project will promote a desirable consistency with County budgeting practices and encourage greater competition in an environment of scarce resources. Reflecting the migration of this portion of the project, the College's Operating Budget includes funds for this effort.

FY2006 Appropriation: \$125,000 (G.O. Bonds).

* Project expenditures will continue indefinitely.

APPROPRIATION AND EXPENDITURE DATA	COORDINATION	MAP																		
<table> <tr> <td>Date First Appropriation</td><td>FY81</td><td>(\$000)</td></tr> <tr> <td>Initial Cost Estimate</td><td></td><td>1,008</td></tr> <tr> <td>First Cost Estimate</td><td></td><td></td></tr> <tr> <td>Current Scope</td><td>FY02</td><td>3,918</td></tr> <tr> <td>Last FY's Cost Estimate</td><td></td><td>4,168</td></tr> <tr> <td>Present Cost Estimate</td><td></td><td>4,168</td></tr> </table>	Date First Appropriation	FY81	(\$000)	Initial Cost Estimate		1,008	First Cost Estimate			Current Scope	FY02	3,918	Last FY's Cost Estimate		4,168	Present Cost Estimate		4,168	<p>This project is coordinated with the scheduled building renovations on the Rockville and Takoma Park Campuses, and the planned construction of new buildings on the Rockville, Gemantown and Takoma Park Campuses.</p> <p>ICEUM & ECAC Facility Planning: College (#886686) PLAR: College (CIP#926659) Roof Replacement: College (CIP#876664) Takoma Park Central Plant (CIP#016600)</p>	
Date First Appropriation	FY81	(\$000)																		
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Last FY's Cost Estimate		4,168																		
Present Cost Estimate		4,168																		
<table> <tr> <td>Appropriation Request</td><td>FY06</td><td>125</td></tr> <tr> <td>Supplemental</td><td></td><td></td></tr> <tr> <td>Appropriation Request</td><td>FY05</td><td>0</td></tr> <tr> <td>Transfer</td><td></td><td>0</td></tr> </table>	Appropriation Request	FY06	125	Supplemental			Appropriation Request	FY05	0	Transfer		0								
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<table> <tr> <td>Cumulative Appropriation</td><td></td><td>3,543</td></tr> <tr> <td>Expenditures/</td><td></td><td></td></tr> <tr> <td>Encumbrances</td><td></td><td>3,494</td></tr> <tr> <td>Unencumbered Balance</td><td></td><td>49</td></tr> </table>	Cumulative Appropriation		3,543	Expenditures/			Encumbrances		3,494	Unencumbered Balance		49								
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Partial Closeout Thru	FY03	0																		
New Partial Closeout	FY04	0																		
Total Partial Closeout		0																		

Planned Lifecycle Asset Replacement: College -- No. 926659

Category: Montgomery College
 Agency: Montgomery College
 Planning Area: Countywide
 Relocation Impact: None

Date Last Modified: January 3, 2005
 Previous PDF Page Number: 20-14 (05 App)
 Required Adequate Public Facility: NO

EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY04	Rem. FY04	Total 6 Years	FY05	FY06	FY07	FY08	FY09	FY10	Beyond 6 Years
Planning, Design and Supervision	1,249	340	9	900	100	100	150	150	200	200	0
Land											
Site Improvements and Utilities											
Construction	19,332	7,108	124	12,100	900	1,400	1,850	2,350	2,800	2,800	0
Other											
Total	20,581	7,448	133	13,000	1,000	1,500	2,000	2,500	3,000	3,000	0

FUNDING SCHEDULE (\$000)

G.O. Bonds	18,641	5,508	133	13,000	1,000	1,500	2,000	2,500	3,000	3,000	0
Current Revenue:											
General	1,940	1,940	0	0	0	0	0	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT (\$000)

DESCRIPTION

This project provides funding for a comprehensive lifecycle renewal and replacement program to protect the investment in College facilities and equipment and to meet current safety and environmental requirements. Funding also provides for project management staff and/or services. This collegewide project is targeted at deteriorating facilities and deferred maintenance of major building systems. This project includes: (1) HVAC system renovation/replacement; (2) major mechanical/plumbing equipment renovation/replacement; (3) interior and exterior lighting system renovation/replacements; (4) electrical service/switchgear renovation/replacement; (5) building structural and exterior envelope refurbishment; (6) parking lot/roadway/sidewalk replacement; (7) asbestos removals not tied to building renovations; (8) major carpet replacement; (9) underground petroleum tank upgrades; and (10) site utility replacement/improvements.

JUSTIFICATION

In August 2002, the College completed a comprehensive building system/equipment assessment, including site utilities and improvements, that identified deficiencies, prioritized replacements and upgrades, and provides the framework for implementing a systematic capital renewal program to complement on-going preventive maintenance efforts. The College continues to have a significant backlog of major building systems and equipment renovations and/or replacements due to the age of the Campuses and deferral of major equipment replacement. Key components of the HVAC, mechanical and electrical systems are outdated, energy inefficient, and costly to continue to repair. The renovation and/or replacement of major building systems, building components and equipment, and site improvements will significantly extend the useful life of the College's buildings and correct safety and environmental problems. The Collegewide Facilities Condition Assessment identified a \$57.8 million deferred maintenance backlog for the three campuses. If additional financial resources are not directed at this problem, College facilities will continue to deteriorate leading to higher cost renovations or building replacements.

Plans and Studies

Schematic Design for Curtain Wall Remediation - Macklin Tower (5/25/01), Curtain Wall and Building Envelope Investigation - Macklin Tower (3/16/01), Collegewide Facilities Condition Assessment (8/02), and Collegewide Facilities Master Plan (January, 2004).

Cost Change

Cost increase to fund corrective work identified in the Facilities Condition Assessment, including project administration.

STATUS

Ongoing.

OTHER

The following fund transfers have been made from this project: \$47,685 to Takoma Park Child Care Center (#946657) (BOT Resol. #93106, #9426 & #94128); \$185,000 to Rockville Surge Building (#966665) (BOT Resol. #11-2291 - 1/21/97); and \$7,000 to Planning, Design & Construction (#906605) (BOT Resol. #01-153). The following fund transfers have been made into this project: \$15,000 from Central Plant Distribution System (#386676) (BOT Resol. #98-82 - 6/15/98) and \$25,000 from Clean Air Act (#956643) (BOT Resol. # 98-82 - 6/15/98). Beginning in FY98, the portion of this project funded by County Current Revenues migrated to the College's Operating Budget. Reflecting the migration of this portion of the project, the College's Operating Budget includes funds for this effort.

FY2006 Appropriation: \$1,500,000 (G.O. Bonds).

* Project expenditures will continue indefinitely.

APPROPRIATION AND EXPENDITURE DATA	COORDINATION	MAP																																																			
<table> <tr> <td>Date First Appropriation</td><td>FY93</td><td>(\$000)</td></tr> <tr> <td>Initial Cost Estimate</td><td></td><td>3,000</td></tr> <tr> <td>First Cost Estimate</td><td></td><td></td></tr> <tr> <td>Current Scope</td><td>FY03</td><td>22,081</td></tr> <tr> <td>Last FY's Cost Estimate</td><td></td><td>20,581</td></tr> <tr> <td>Present Cost Estimate</td><td></td><td>20,581</td></tr> <tr> <td>Appropriation Request</td><td>FY06</td><td>1,500</td></tr> <tr> <td>Supplemental</td><td></td><td></td></tr> <tr> <td>Appropriation Request</td><td>FY05</td><td>0</td></tr> <tr> <td>Transfer</td><td></td><td>0</td></tr> <tr> <td>Cumulative Appropriation</td><td></td><td>8,581</td></tr> <tr> <td>Expenditures/</td><td></td><td></td></tr> <tr> <td>Encumbrances</td><td></td><td>7,488</td></tr> <tr> <td>Unencumbered Balance</td><td></td><td>1,093</td></tr> <tr> <td>Partial Closeout Thru</td><td>FY03</td><td>0</td></tr> <tr> <td>New Partial Closeout</td><td>FY04</td><td>0</td></tr> <tr> <td>Total Partial Closeout</td><td></td><td>0</td></tr> </table>	Date First Appropriation	FY93	(\$000)	Initial Cost Estimate		3,000	First Cost Estimate			Current Scope	FY03	22,081	Last FY's Cost Estimate		20,581	Present Cost Estimate		20,581	Appropriation Request	FY06	1,500	Supplemental			Appropriation Request	FY05	0	Transfer		0	Cumulative Appropriation		8,581	Expenditures/			Encumbrances		7,488	Unencumbered Balance		1,093	Partial Closeout Thru	FY03	0	New Partial Closeout	FY04	0	Total Partial Closeout		0	<p>This project is coordinated with the Rockville, Takoma Park and Germantown Campus Utility Master Plans, building renovations on the Rockville and Takoma Park Campuses, and the following projects:</p> <p>Elevator Modernization: College (CIP#046600) Energy Conservation: College (CIP#816611) Facility Planning: College (CIP#886686) Life Safety Improvements: College (CIP#046601) Macklin Tower Alterations (CIP#036603) Roof Replacement: College (CIP#876664) TP Central Plant (CIP#016600)</p>	
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Takoma Park Central Plant -- No. 016600

Category **Montgomery College**
 Agency **Montgomery College**
 Planning Area **Takoma Park**
 Relocation Impact **None.**

Date Last Modified
 Previous PDF Page Number
 Required Adequate Public Facility

January 3, 2005
 20-18 (03 App)
 NO

EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY04	Rem. FY04	Total 6 Years	FY05	FY06	FY07	FY08	FY09	FY10	Beyond 6 Years
Planning, Design and Supervision	345	336	9	0	0	0	0	0	0	0	0
Land											
Site Improvements and Utilities	5,323	0	600	4,723	2,643	1,040	1,040	0	0	0	0
Construction											
Other											
Total	5,668	336	609	4,723	2,643	1,040	1,040	0	0	0	0

FUNDING SCHEDULE (\$000)

G.O. Bonds	2,834	168	304	2,362	1,322	520	520	0	0	0	0
State Aid	2,834	168	305	2,361	1,321	520	520	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT (\$000)

Maintenance				-40	-4	-4	-8	-8	-8	-8	0
Energy				-100	-10	-10	-20	-20	-20	-20	0
Program-Staff				-40	-4	-4	-8	-8	-8	-8	0
Program-Other				-250	-25	-25	-50	-50	-50	-50	0
Offset Revenue				0	0	0	0	0	0	0	0
Net Impact				-430	-43	-43	-86	-86	-86	-86	0

DESCRIPTION

This project provides for the design and construction of a central heating and cooling plant on the Takoma Park Campus as recommended in the College's campus utilities master plan (October 1991). The plan for a Campus central plant was further developed in the Campus facilities master plan (February 1998) where it was recommended that the plant be located in the planned Student Services Center on the north end of the existing Campus. This project is integrated into the overall planning and coordination for the Campus expansion project. The project includes installation of boilers and chillers with associated equipment, the provision of natural gas service, and the construction of a hot water and cold water distribution piping system to eleven existing campus buildings.

JUSTIFICATION

This project implements the recommendations of the campus utilities master plan (10/91) and campus facilities master plan (2/98). The Campus' existing heating and cooling equipment is typically 20-30 years old and beyond its useful economic life. Due to the age of the equipment and increasing maintenance problems and costs, the Campus is experiencing a significant increase in mechanical system problems and heating/cooling outages. Based on a life cycle cost analysis, the installation of a central heating/cooling plant offers significant equipment replacement, energy and maintenance savings to the College.

Plans and Studies

Takoma Park Campus Utilities Master Plan (October 1991); Takoma Park Campus Facilities Master Plan (February 1998); and Program Justification and Description Report for Students Services Ctr (3/27/98) and Takoma Park Campus Central Plant & Dist. System (8/15/99).

Cost Change

Decrease due to change in project scope.

STATUS

Design phase. The Takoma Park central plant project implements a portion of the Campus' utilities master plan. The need to provide new systems for heating and cooling campus buildings was articulated in the utilities master plan and satisfying this requirement is critical to the planned renovation of the existing campus buildings. The planning for the central plant project was integrated into the plan for the Takoma Park Campus expansion with the September 1999 submission of the Part I/II facility program for the project to the State. The State approved the project program in July 2000. The College awarded an engineering design contract for this project in December 2001 and the central plant design is being coordinated with the design of the Student Services Center as part of the Campus expansion project. The facilities program for the project has been revised to reflect the relocation of the Cultural Arts Center and the concomitant decision to not extend the piping distribution system over the WMATE/CSX tracks to the College's Georgia Avenue expansion site. The revised program reflects a total cost reduction of \$846,000, which includes a reconciliation of the state and county funding amounts for design and construction administration (\$280,000), and a reduction in the pipe distribution system (\$566,000).

OTHER

State share of project based on anticipated eligible costs. Design fees above approximately 7% of estimated construction costs may not be eligible for State reimbursement.

FY06 Appropriation: \$2,080,000 (\$1,040,000 -- G.O. Bonds and \$1,040,000 -- State Aid).

APPROPRIATION AND EXPENDITURE DATA	COORDINATION	MAP																																																			
<table> <tr> <td>Date First Appropriation</td><td>FY01</td><td>(\$000)</td></tr> <tr> <td>Initial Cost Estimate</td><td></td><td>5,204</td></tr> <tr> <td>First Cost Estimate</td><td></td><td></td></tr> <tr> <td>Current Scope</td><td>FY05</td><td>5,668</td></tr> <tr> <td>Last FY's Cost Estimate</td><td></td><td>5,668</td></tr> <tr> <td>Present Cost Estimate</td><td></td><td>5,668</td></tr> <tr> <td>Appropriation Request</td><td>FY06</td><td>2,080</td></tr> <tr> <td>Supplemental</td><td></td><td></td></tr> <tr> <td>Appropriation Request</td><td>FY05</td><td>0</td></tr> <tr> <td>Transfer</td><td></td><td>0</td></tr> <tr> <td>Cumulative Appropriation</td><td></td><td>3,598</td></tr> <tr> <td>Expenditures/</td><td></td><td></td></tr> <tr> <td>Encumbrances</td><td></td><td>3,578</td></tr> <tr> <td>Unencumbered Balance</td><td></td><td>10</td></tr> <tr> <td>Partial Closeout Thru</td><td>FY03</td><td>0</td></tr> <tr> <td>New Partial Closeout</td><td>FY04</td><td>0</td></tr> <tr> <td>Total Partial Closeout</td><td></td><td>0</td></tr> </table>	Date First Appropriation	FY01	(\$000)	Initial Cost Estimate		5,204	First Cost Estimate			Current Scope	FY05	5,668	Last FY's Cost Estimate		5,668	Present Cost Estimate		5,668	Appropriation Request	FY06	2,080	Supplemental			Appropriation Request	FY05	0	Transfer		0	Cumulative Appropriation		3,598	Expenditures/			Encumbrances		3,578	Unencumbered Balance		10	Partial Closeout Thru	FY03	0	New Partial Closeout	FY04	0	Total Partial Closeout		0	Takoma Park Campus Expansion (#996662) Montgomery College asserts that this project conforms to the requirements of relevant local plans, as required by the Maryland Economic Growth, Resource Protection and Planning Act.	
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Montgomery College Office of Facilities FY2006 Utility Projection Report
1/4/2005

UTILITY	ACTUAL FY 2003	Actual FY 2004 (10/01/2004)	Budget Approved FY 2005 ⁽¹⁾	PROJECTED FY 2005 ⁽²⁾ 11/19/2004	10/01 Proj. UNIT CHNG. FY 2006 ⁽²⁾	11/19 Proj. CONSUMP.CHNG FY 2006 ⁽²⁾	11/19/2004 PROJECTED FY 2006 ^{(2) (5)}
=====							
ELECTRICITY							
kWh	26,901,141	26,474,982	27,000,000	28,953,000	27,000,000	3,803,000	30,803,000
Cost (\$)	1,669,152	1,798,698	2,122,200	2,654,990	494,100	418,330	3,388,330
UNIT (\$/kWh)	0.0620	0.0679	0.0786	0.0917	0.0183	0.1100	0.1100
N.GAS (Firm)							
Therms (thm)	148,024	155,377	185,560	159,000	175,000	30,000	205,000
Cost (\$)	107,764	162,936	179,011	198,750	(1750.00)	37,200	254,200
Unit (\$/therm)	0.728	1.049	0.965	1.250	(0.01)	1.240	1.24
N.GAS (Irate)							
Therms (thm)	425,376	406,098	450,000	419,000	425,000	(6,000)	419,000
Cost (\$)	243,037	335,400	389,700	477,660	(4250.00)	(6780.00)	473,470
Unit (\$/therm)	0.571	0.826	0.866	1.140	(0.01)	1.130	1.13
WATER							
kilogallons	22,236	16,163	30,000	18,000	18,000	1,200	19,200
Cost (\$)	59,039	50,462	84,600	57,960	1,800	3,984	63,744
Unit (\$/kgal)	2.66	3.12	2.82	3.22	0.10	3.32	3.32
SEWER							
kilogallons	15,964	11,282	20,464	13,000	13,000	1,200	14,200
Cost (\$)	65,920	51,285	84,312	60,840	1,820	5,784	68,444
Unit (\$/kgal)	4.13	4.55	4.12	4.68	0.14	4.82	4.82
NO.2 FUEL OIL							
Gallons (gal)	41,000	31,080	50,000	41,000	41,000	0	41,000
Cost (\$)	40,069	34,312	44,000	64,370	(6,150)	0	58,220
Unit (\$/gal)	0.98	1.10	0.88	1.57	(0.15)	1.42	1.42
PROPANE							
Gallons (gal)	0	3,500	3,500	3,500	3,500	0	3,500
Cost (\$)	0	4,200	3,500	4,410	(350)	0	4,060
Unit (\$/gal)	0.00	1.20	1.00	1.26	(\$0.10)	1.16	1.16
=====							
TOTAL COST(\$)⁽³⁾	2,184,981	2,437,293	2,907,322	3,518,980	485,570	458,518	4,310,468
MCAD⁽⁴⁾			30,000	30,000			
Total				3,548,980			
Approved Budget	2,290,000	2,786,000	2,937,322	2,937,322			
SURPLUS/(DEFICIT)	105,019	348,707	0	(611,658)			

Total FY2006	
Budget	\$4,310,468

- (1) ICEUM 10/03 Utility Rates & 05/04 Utility Tax
(2) Based Upon College Update of ICEUM 09/04 Utility Rates
(3) Facilities Acct.No.1110-226004-6501-0060
(4) MCAD Acct.No. 1110-130164-6501-0060(\$30,000 FY05)
(5) Budget includes GT Child Care(\$5,00) & TP SSC(\$200,000) Both Open Spring FY06 & MCAD

1/4/2005
1:28 PM

INTERAGENCY COMMITTEE ON ENERGY AND UTILITIES MANAGEMENT UTILITY RATES

September 28, 2004

FY05, FY06

Note: Unit cost or percentage change is a cap. Individual agency unit costs may be below the ICEUM established number, but can not exceed the projection. Energy cost projections for FY05 and FY05 assume the fuel energy tax at the level established in FY05.

	<u>BUDGETED FY04</u>	<u>BUDGETED FY05</u>	<u>NEW PROJECTED FY05</u>	<u>PROJECTED FY06</u>
Electricity	9.2 % increase over Actual FY 03	21% increase over Actual FY 03	35.5% increase over Actual FY 04	20% increase over Projected FY 05
Electricity rate projections include the price premium for wind energy and generation procurement credits. Electricity rate projections do not include divestiture credits.				
No. 2 Fuel Oil	\$ 0.84 per gallon	\$ 0.86 per gallon	\$ 1.57 per gallon	\$ 1.42 per gallon
Natural Gas	\$ 1.00 per therm	\$ 0.98 per therm	\$ 1.25 per therm	\$ 1.24 per therm
<u>Motor Fuels:</u> Note: Includes \$0.235 per gallon State tax.				
Unleaded	\$ 1.10 per gallon	\$ 1.35 per gallon	\$ 1.55 per gallon	\$ 1.45 per gallon
Note: Includes \$0.245 per gallon State tax.				
Diesel	\$ 1.05 per gallon	\$ 1.30 per gallon	\$ 1.41 per gallon	\$ 1.45 per gallon
Note: CNG rate excluded Federal excise taxes, which the County does not pay.				
CNG: (\$/gallon equivalent):				
Slow Fill	\$ 1.00 per g.e.	\$ 0.90 per g.e.	no longer used	no longer used
Fast Fill	\$ 1.25 per g.e.	\$ 1.49 per g.e.	\$ 1.26 per g.e.	\$ 1.30 per g.e.
Ethanol	\$ 1.45 per gallon	\$ 1.68 per gallon	\$ 1.91 per gallon	\$ 1.80 per gallon
Propane	\$ 1.00 per gallon	\$ 1.00 per gallon	\$ 1.26 per gallon	\$ 1.16 per gallon
Water & Sewer	0% increase over Actual FY 03	3% increase over Actual FY 03	3% increase over Actual FY 04	3% increase over Projected FY 05



**MONTGOMERY COUNTY DEPARTMENT
OF PARK AND PLANNING**

RESOURCE CONSERVATION PLAN

Fiscal Year 2006

January 5, 2005

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RESOURCE CONSERVATION PLAN

Fiscal Year 2006

The Maryland-National Capital Park and Planning Commission Department of Park and Planning, Montgomery County

I. INTRODUCTION

The Maryland-National Capital Park and Planning Commission was established by the Maryland General Assembly in 1927. The Commission serves the bi-county area of Prince George's and Montgomery Counties. This area has a population of 1.7 million citizens and extends over 1,000 square miles adjacent to the Nation's Capital. The purpose, powers, and duties of the Commission are found in Article 28 of the Annotated Code of Maryland. Pursuant to this Article, the Commission is empowered to:

- acquire, develop, maintain, and administer a regional system of parks and defined as the Metropolitan District;
- prepare and administer a general plan for the physical development in the areas of the two Counties defined as the Regional District; and
- conduct a comprehensive recreation program for Prince George's County.

The Commission's function in Montgomery County is carried out by The Montgomery County Department of Park and Planning under the guidance of The Montgomery County Park and Planning Board. The staff of the Department provides recommendations, information, analysis, and services to The Planning Board, County Council, other agencies of government, and the general public. The Department functions within the context of a budget and work program annually recommended by the County Executive and approved by the County Council, as amended at the bi-annual meetings.

The Department oversees the acquisition, development, and management of a nationally recognized, award winning park system providing County residents with open space for recreational opportunities and natural resources stewardship. The current system represents more than 30,000 acres and 382 parks of different sizes, types, and functions, including stream valley, conservation, regional, special, local, and community parks. Within these parks can be found a diversity of recreational activities and opportunities including hiker-biker trails, ball fields, athletic fields, adventure playgrounds, boating, golfing, skating, tennis facilities, and conference and recreation centers. During this past year, park visitation (including Enterprise Fund operations) exceeded 12 million.

The Department is also responsible for the preparation of master plans and sector plans, which are recommended by the Planning Board and approved by the County Council. The Department reviews development applications for conformance with existing laws, regulations, master plans, and policies and then presents its

recommendations to the Planning Board for action.

This report presents the accomplishments to date and the plans for the next fiscal year of the Montgomery County Park and Planning Commission to conserve energy and water resources as part of a comprehensive resource conservation program launched July 2003.

II. RESOURCE CONSERVATION PLAN – Fiscal Year 2005

The overall goal of the comprehensive resource conservation program is to establish programs and projects that will efficiently use energy and water resources to fulfill the mission of the Commission to serve the citizens and visitors of Montgomery County.

Energy and water are a critical component to the day to day operation of the park system. The resource conservation program strives to improve operations and maintenance practices to efficiently use electricity, natural gas, propane, and water to provide the programs offered by the parks.

Though the implementation of a series of best management practices the Montgomery County Park and Planning Commission was able to reduce consumption for the first time in seven years.

The program focused on three activities in this fiscal year:

- Implementation of an employee based “Turn it Off – Turn it Down” program.
- Implementation of Maintenance and Building Operations improvements
- Implementation of projects at six major facilities to reduce consumption.

III. BUDGET – Fiscal Year 2004

Energy rates and costs increased significantly in fiscal year 2004. Electricity rates increased by 7% and natural gas rates increased by 32.7%. The resulting increase in costs of \$74,637 were a direct result of the rapid rise in rates. If consumption had not been reduced this year the increase would have exceeded \$200,000.

The total costs were \$2,397,585.00 in fiscal year 2004:

Parks	\$1,353,467.00
Enterprise	\$ 957.815.00

IV. BUDGET – Fiscal Year 2005

Electricity rates were transitioned on July 1, 2004 from fixed rates to open market pricing for electricity as part of the deregulation process. Rates increased by 24%.

Natural gas prices increased by an additional 5% and propane increased by 10%.

The county wide electricity procurement was expected to reduce the proposed electricity rate increase. But due to high market rates and factors not in control of the procurement process a contract was not able to be secured for most of the Commissions small account types. It is the hope of all the participants that the market will moderate to the point where a contract can be agreed to by all parties. In the mean prices are based on remaining on the default rates and will remain there for the rest of the fiscal year.

As the year has progressed energy prices become even higher and the overall impact could result in a budget increase of \$580,800.00 in fiscal year 2005.

The total costs are projected to be \$2,859,200.00 in fiscal year 2005:

Parks	\$1,725,594.00
Enterprise	\$1,133,606.00

Even with the projected reductions in consumption the utility budget began this year with this estimated increase due to the changes in market rates.

V. RESOURCE CONSERVATION PLAN – Fiscal Year 2006

Plans are underway to continue to reduce consumption growth on an annual basis. The objective is to reduce the increase from the average annual growth of 7% per year to 2% per year. In FY 2004 the program exceeded this goal.

The program elements in fiscal year 2005 are:

- Expand the employee awareness and participation program
- Implement “no-cost and low cost” operations and maintenance improvements at key facilities
- Implement water conservation programs county wide

VI. BUDGET – Fiscal Year 2006

The proposed budget for fiscal year 2006 is \$3,125,557.00 in:

Parks	\$1,897,863.00
Enterprise	\$1,227,684.00

RESOURCE CONSERVATION PLAN

Fiscal Year 2006

Summary

The information on this page reflects the facilities owned or operated
by this agency as of the end of **FY 04 (June 30, 2004)**

Agency	Maryland-National Capital Park and Planning Commission																			
Number of Facilities	202 Facilities that have utilities	Change in number of facilities	0																	
Total square feet	757,637	Change in total ft²	0																	
Average operating hrs/year	Varies	Change in avg. operating hrs/year	None																	
Other changes effecting energy consumption	<p>The implementation of a comprehensive energy management and water conservation programs by the three operating Divisions: North Parks Region, South Parks Region, and Enterprise Operations contributed to a significant reduction in consumption. MNCPPC Staff were asked to implement a series of low cost “best management practices” and operations improvements resulted in a significant reduction in consumption during the winter.</p> <p>In prior years consumption increased by an average of 7% per year.</p> <p>This year the consumption variances show an overall decrease:</p> <table><tr><td>Electricity</td><td>+1.8%</td></tr><tr><td>Natural Gas</td><td>+1.0%</td></tr><tr><td>Propane</td><td>-6.7%</td></tr><tr><td>Water</td><td>-4.5%</td></tr></table> <p>Energy Unit Costs variances this year were:</p> <table><tr><td>Electricity</td><td>+ 7.0%</td></tr><tr><td>Natural Gas</td><td>+32.7%</td></tr><tr><td>Propane</td><td>-0.7%</td></tr><tr><td>Water</td><td>0%</td></tr></table> <p>The increases in electricity rates and natural gas were significant. MNCPPC implemented a series of actions to reduce consumption and to stay on budget. The results of the program decreased consumption and overall the estimated \$175,000 in additional costs due primarily to the natural gas price increases was reduced to \$74,629.</p>				Electricity	+1.8%	Natural Gas	+1.0%	Propane	-6.7%	Water	-4.5%	Electricity	+ 7.0%	Natural Gas	+32.7%	Propane	-0.7%	Water	0%
Electricity	+1.8%																			
Natural Gas	+1.0%																			
Propane	-6.7%																			
Water	-4.5%																			
Electricity	+ 7.0%																			
Natural Gas	+32.7%																			
Propane	-0.7%																			
Water	0%																			

New Measures

July 1, 2004 through June 30, 2005

This table shows information on resource conservation measures implemented during FY 05

Measures - New: (Implemented during FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$)
Capital Improvement Projects:						
Selected Heat Pump and HVAC Roof Top Unit Replacements	Sept. 2004	\$32,500	\$9,400 on annual service costs	Electricity and Natural Gas	82,000 kWh, 2,300 therms	\$8,500
Installation of Programmable Thermostats	March 2005	\$1,200	NA	Electricity and Natural Gas	20,000 kWh, 1,000 therms	\$2,500
Installation of lighting controls interior and exterior	Oct, 2004	\$4,800	NA	Electricity	40,000 kWh	\$3,200
Upgrade of selected lighting at maintenance facilities	Nov. 2004	\$2,000	NA	Electricity	16,000 kWh	\$1,300
Repair and reprogramming of Cabin John Ice Rink HVAC systems and Dehumidification Systems	Oct. 2004	\$7,400 * See below	\$3,000 on annual service costs	Electricity and Natural Gas	127,000 kWh, 4,600 therms	\$15,000
Total		\$47,900	\$12,400			\$30,500
Operations and Maintenance:						
Employee Training and Participation Programs	January 2004 to June 2005	\$9,500	NA	Electricity, Natural Gas, and Propane	127,000 kWh, 3,600 therms & 800 Pounds	\$15,000 Annual Cost Avoidance
Temperature and Operations Controls Program	January 2004 to June 2005	\$6,000	NA	Electricity, Natural Gas, and Propane	85,000 kWh, 2,500 therms & 500 Pounds	\$10,000 Annual Cost Avoidance
Un-occupied Cycle Controls Program	January 2004 to June 2005	\$3,000	NA	Electricity and Natural Gas	85,000 kWh, 3,000 therms	\$10,000 Annual Cost Avoidance
Cabin John Complex and Brookside Gardens Complex Operations and Maintenance Programs	January 2004 to June 2005	\$4,000 Combined with Item * above	\$3,000 on annual service costs	Electricity and Natural Gas	80,000 kWh, 2,500 therms	\$9,000 Annual Cost Avoidance
Total		\$22,5000	\$3,000			\$44,000

The completed measurers and programs for Fiscal Year 2005 are:

During this program year the MNCPPC implemented an employee based “Turn it Off – Turn it Down” program. The specific elements of the program are:

- Turn off all lights, computers, printers, copiers, heaters, fans, etc. when you leave at the end of your workday.
- Turn off all lights and your computer monitor when you leave your office during the day for a period of 30 minutes or longer. For extended periods, again turn everything off.
- Turn off lights in storage, kitchen, and conference rooms when not in use
- Reduce the use of decorative or accent lights, especially in the daytime.
- Turn off all building exterior lights, parking lot lights, pathway lights, and athletic field lighting in the daytime. Make sure time clocks or controls are programmed properly to turn on these lights prior to sunset.
- Where controls are provided make sure the building temperature and operations are turned down in non-occupied periods such as at night and on weekends.
- Be sure all seasonal operating equipment is turned off where feasible, such as signs, vending machines, concession equipment, etc.
- Keep doors, windows, chimneys, vents, and garage doors closed when the buildings are not in use.

Maintenance and Building Operations Staff implemented the following improvements:

- Temperature settings will be lowered by one degree in all facilities
- Programmable thermostats will be programmed to lower the temperatures in non-occupied times to match current operations. Local Managers will be consulted on time settings.
- Water heater temperature settings will be lowered.
- Exterior lighting controls will be programmed to match current operations.
- All natural gas heaters and electric water heaters will be checked to be sure that they are operating as efficiently as possible during this period of high rates.
- Additional programmable thermostats and occupancy based lighting controls will be installed at selected facilities commission wide.
- Additional time clocks and photo cell sensors to control exterior lighting will be installed

A series of broad based improvements were implemented at six major facilities to reduce consumption.

- ✓ Cabin John Complex and Ice Rink
- ✓ Wheaton Ice Rink
- ✓ Brookside Gardens Complex
- ✓ Olney Manor Recreation Park
- ✓ South Germantown Recreation Park
- ✓ Shady Grove Maintenance Facility

Existing Measures

Fiscal Years 2000 to 2004

This table shows information on resource conservation measures implemented prior to FY 05

Measures - Existing: (implemented from FY 98 to FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$)
Capital Improvement Projects:						
Equipment Replacement Project	FY 2000 to FY 2004	\$83,000 est.	\$12,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	170,000 kWh, 5,000 therms & 1,100 Pounds	\$26,000 est. Annual Cost Avoidance
Equipment Retrofit Projects	FY 2000 to FY 2004	\$41,000 est.	\$6,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	86,000 kWh, 3,000 therms & 600 Pounds	\$16,000 est. Annual Cost Avoidance
Controls Improvements	FY 2000 to FY 2004	\$10,000 est.	NA	Electricity	36,000 kWh	\$3,000 est. Annual Cost Avoidance
Lighting Projects	FY 2000 to FY 2004	\$6,000 est.	NA	Electricity	26,000 kWh	\$2,000 est. Annual Cost Avoidance
Total		\$140,000 est.			318,000 kWh, 6,000 therms & 1,700 Pounds	\$47,000 Annual Cost Avoidance
Operations and Maintenance:						
Operations and Maintenance Best Management Practice and Programs	FY 2000 to FY 2004	\$40,000 est.	NA	Electricity, Natural Gas, and Propane	85,000 kWh, 2,900 therms & 500 Pounds	\$15,000 est. Annual Cost Avoidance
Total		\$40,000			85,000 kWh, 2,900 therms & 500 Pounds	\$15,000 est. Annual Cost Avoidance

Planned Measures

Fiscal Year 2006

This table shows information on resource conservation measures planned
to be implemented in FY 06 (July 1, 2005 through June 30, 2006)

Measures - Planned: (for FY06)	projected completion date (mo/yr)	projected initial cost (\$)	projected annual net impact on maintenance cost (\$)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings (\$)
Capital Improvement Projects:						
Equipment Replacement Project	First Quarter FY 06	\$20,000 est.	\$5,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	64,000 kWh, 1,800 therms & 300 Pounds	\$7,000 est. Annual Cost Avoidance
Controls Improvements	First Quarter FY 06	\$10,000 est.	NA	Electricity	42,000 kWh	\$3,300 est. Annual Cost Avoidance
Lighting Projects	Third Quarter FY 06	\$15,000 est.	NA	Electricity	9,500 kWh	\$7,500 est. Annual Cost Avoidance
Total		\$45,000	\$5,000			\$17,800
Operations and Maintenance:						
Energy Assessment and Best Management Practices Programs	Entire Year	\$10,500	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	\$3,000 Annual Cost Avoidance
Employee Training and Participation Programs	Entire Year	\$9,500	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	\$3,000 Annual Cost Avoidance
Operations and Maintenance Improvement Programs	Entire Year	\$10,000 est.	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	\$3,000 est. Annual Cost Avoidance
Total		\$30,000	NA			\$12,000

The planned measures and projects for Fiscal Year 2006 are:

Expand the Employee Awareness Program

Implement additional operations improvements to reduce consumption – Underway

Issue Employee Information Brochure – Home and Work 04

Conduct Half Day Training for Facility Operations and Maintenance Staff

Complete the installation of the “Web Based Faser Report Programs” on computers for Divisions

Managers and Key Facility Operations Staff

Establish “Best Idea” for No Cost Savings Content

Issue Quarterly Progress Reports to Staff

Implement a series of broad based improvements the following facilities to reduce consumption.

- ✓ Athletic Field Lighting Operations County Wide
- ✓ Parks Maintenance Complexes
- ✓ Golf Course Maintenance Facilities
- ✓ Montgomery County Office Building
- ✓ Parkside Headquarters
- ✓ Park Police Operations



FY 2006

Resource Conservation Plan

**Department of Public Works and Transportation
Division of Operations
Engineering and Management Services**

January 2005

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I. Executive Summary

The Department of Public Works and Transportation (DPWT), Engineering and Management Services at the Division of Operations has enacted numerous energy efficiency programs and continues to foster activities that enhance energy efficiency, and reduce utility costs to ensure energy efficient operation of facilities.

The Division of Operations within DPWT has for more than ten years, accomplished millions of dollars in energy savings by implementing our Energy Design Guidelines into new and renovation projects to ensure efficient operation and maintainability of mechanical and electrical systems. The Energy Design Guidelines document has been extremely effective in providing basic building design parameters for mechanical, lighting and envelope systems. The document is now being revised to provide specific design guidance for various building types such as libraries, indoor pools, fire stations, community centers, etc.

In response to Electricity Deregulation, which became effective in June 2004, DPWT has pioneered a unique energy purchasing methodology that allows same day bidding and contract award. To date, DPWT has awarded several 14 to 17 months contracts, with various suppliers for a total of \$11.8 M, with total savings of \$1.5 M. To bring this about, the County enacted a new Procurement Regulation that delegates electricity procurement authority from the CAO to the Director DPWT and created a unique procurement document titled "Request for Energy Proposals" (RFEP) to select and qualify potential bidders. See more details in Section II.B. The RFEP also enabled award of the largest Green energy contract for any Municipality. Montgomery County including 17 agencies and Municipalities now purchase wind energy for 5% of the total yearly energy consumption. The contract may be re bid or negotiated after two years.

As we pursue our goals towards greater energy efficiency, on August 20th, 2004, the Engineering and Management Services branch of the Division of Operations within DPWT hosted an EPA Energy Star Conference to address emerging issues with Green buildings and energy efficiency, to present an update of the "benchmarking" program and offerings for local governments. The all day conference was attended by various local government officials including Fairfax and Arlington Counties. The morning session provided an interactive discussion to identify energy efficiency issues and challenges that need to be addressed as we move toward environmentally friendly "green buildings." During the afternoon, Energy Star provided hands on training to use the Energy Management Guidelines and Self Assessment tool to benchmark buildings Energy performance. Several good ideas came out of the event that will soon be implemented to further enhance energy efficiency in County buildings.

The DPWT programs has been successful in consistently providing millions in savings by: 1) leading and implementing the electricity procurement program, 2) by promoting energy conscious design practices to ensure the implementation of energy savings opportunities in new designs and retrofit of existing systems and 3) by auditing utility bills resulting in thousands of dollars in cost avoidance payments and obtaining refunds from utility companies.

II. Energy Management

A. Utility Budget and Bill Auditing

The Division of Operations is responsible for tracking and auditing all utility invoices from various utility providers for County facilities to insure accurate budget projections. The old FASER program has been replaced with a customized utility bill tracking software. This system can accept electronic billing data and is capable of extracting various statistics of the utility consumption patterns for county facilities and identify billing discrepancies. The software enhances the Division's expertise to recognize billing anomalies and obtain refunds from utility companies. In FY 03-04, E& MS was successful in identifying \$119,187.63 by identifying incorrect billing charges and resulted in thousands of dollars in refunds. Obtaining refunds from utility companies is a very tedious and time consuming process. The Division of Operations has successfully and relentlessly pursued this task.

B. Electricity Procurement

With the advent of electric deregulation there has been drastic changes occurring in the US electricity industry and a greater need to anticipate changes in provision of electricity and related services. Effective June 2004, electricity supply rates have been deregulated allowing commercial customers to choose the electricity supplier. Under current settlements in Maryland, a default Standard Offer Service (SOS) will still be available from the Local Electricity Distribution Company (EDC). The new default rate will be established by the EDC based on a series of auctions with its suppliers. SOS rates will be determined by market forces. The new default service rates have increased in June 2004 to an average of 44 % over previous years. The County agencies are major consumers of utility services spending upward of \$53 million annually for 2,200 separate accounts on electricity alone.

The County Task Force on Electric Deregulation was established in June 1997 to develop recommendations regarding public policies and strategic actions to be taken by various agencies prior to, during transition to, and under the coming electric utility deregulation. The task force membership represents a broad spectrum of county agencies and townships. The Division of Operations took the leadership role in establishing prospective suppliers and has also lead in contracting the procurement of electricity for all agencies. Cost effectiveness and reliability being fundamental to the procurement process.

In preparation to avoid "default service" rates, and to be a successful player in the volatile energy market Division of Operations has taken several steps to facilitate "same day" bidding and contract award for 17 county agencies and municipalities. Thus, a regulation was enacted to shift electricity procurement authority from the CAO to the Director DPWT. Concurrently, the Division of Operations took the lead and as a cooperative effort among County Agencies, crafted a procurement document nicknamed "Request for Energy Procurement" or RFEP. This document has now been implemented several times and as of this date, its implementation is responsible for a combined \$1.5M in savings through December 2005.

C. Design Review Team

The Division of Operations Design Team has received the DPWT Team Recognition Award for excellence. The team has been credited with saving millions of dollars in current and future operational costs for its dedication to review and verify the adequacy of mechanical and electrical design parameters.

The Division of Operations will eventually maintain and operate all new buildings under design and as such, the division oversees the design, construction and maintenance of County government facilities under the executive branch of Montgomery County Government and supports facilities spanning a wide variety of functions associated with the County Government and public services.

Under the Division of Operations, the Engineering and Management Services (EMS) sets and enforces the Energy Design Guidelines standards for the Division as a whole, based on simultaneous consideration of energy efficiency, indoor air quality and maintainability. EMS prepares the Energy Program of Requirements (EPOR) for all new building designs as well as retrofits and provides technical guidance to the sections as needed on the path to reliable, economical facilities that are free of indoor air quality problems. As such, the division has played and it will continue to perform a key role in the energy efficiency of county buildings assisting the Design Division by enforcing the Energy Design Guidelines to ensure adequate mechanical design and construction of new facilities.

The Division of Operations experience is showing that energy-efficient building design pays immediately and can be successfully enforced. The Division of Operations provides energy engineering and timely review of project plans and specifications for all new and retrofit CIP projects. The Division is also responsible for producing a blue print for envelope and mechanical and lighting systems design to include energy analysis and life cycle costs for all design projects. It is worthy to note that this cost avoidance measure is not immediately visible; however, to date several millions of dollars have been saved through this effort.

D. Energy Conservation Projects

The Division of Operations implemented several energy conservation programs in FY04 including the replacement / retrofit of time clocks with programmable counterparts, adding photo cell for parking lots, and replacing faulty wiring on fixture ballasts in several facilities to increase bulb life. Other efforts include an energy study for the Executive Office Building and the Judicial Center. These all electric buildings, the study will determine the feasibility of retrofitting the heating plant with Natural Gas and identify capital costs as well as savings due to reduced energy cost. The computer model will also be used to evaluate additional energy saving alternatives.

III. Energy Design Guidelines

A. Background

In 1985 County legislation targeted a roughly 40 percent energy reduction in the design of new county facilities. At that time the Division of Operations began developing comprehensive, integrated design guidelines for new buildings. A series of research grants and projects brought together new technologies, cost control concepts and design process improvements

Mechanical systems typically account for more than 50% of the total energy consumption in a typical building. Today, with the prospect of ever increasing energy rates during due to unregulated energy suppliers and the loss of Standard Offer Service, principally, there needs be an effort to optimize mechanical systems design to achieve equitable savings in the operation and maintenance of mechanical equipment.

B. Overview

The Building Design Guideline and the Division of Operations Energy Design Guideline documents are two documents that reflect our policy on designing new buildings with energy efficiency components. The goal of Energy Design Guideline is to improve the design of new facilities to meet low energy budgets and minimize life-cycle costs. These documents are updated as needed to reflect new technologies. The terms “green building”, “green technology”, “sustainable building” or “sustainable design”, and “energy efficient design” have been used interchangeably. Sustainable Building Design encompasses five different areas only one of which addresses mechanical systems. The Energy Design Guidelines will specifically address energy consuming mechanical and lighting equipment and will facilitate compliance with “Green Building” design practices. The following components of energy efficient technology are only part of what the Division of Operations accomplishes by enforcing the Guidelines. Each technology provides a contribution based on implementation of new technology. Following is a list of technologies and estimated percent implementation completion.

Lighting

Historically, lighting was the biggest energy user in county facilities. Due to implementation of new technology, the current cost distribution for lighting is now about 15 %. In the late 1980's a major revolution occurred in lighting technologies for buildings. New technology lamps, ballasts, fixtures and sensors entered the market that could provide energy savings of 40 to 90 percent in every office lighting application, from fluorescent lighting to down-lights to exit signs. Virtually every existing light fixture in county facilities had become “economically obsolete”.

A 40 % energy savings is achieved by the replacement of T12 to T8 fluorescent lamps. Likewise, replacing incandescent fixtures with compact fluorescents provides an energy savings of 71 %. The estimated savings contribution for this technology assumes 15 % total energy consumption for lighting and that the program is now 100 % complete. Further maintenance costs may now be reduced by incorporating new technology that substantially increases

longevity of T8 fluorescent tubes. The use of High output T5 bulbs will be implemented for the replacement of Metal halide bulbs in warehouses and repair garages.



Motors and Variable Fluid Flow

Design Guideline promotes Use of premium efficiency motors and Variable Frequency Drives. The use of premium efficient motors in new designs and retrofits has a significant contribution in our energy conservation program. An assessment program is now underway, however, it is estimated that through the efforts of new design and retrofits, about half of all fans and pumps (71/2 HP or larger) in all buildings, have been fitted with premium efficiency motors. In addition, about 15% of all fans and pumps now utilize variable speed drives through new design and retrofits. The combination of VFD and premium efficiency motors is responsible for a sizable energy savings. Premium efficiency motors typically achieve a 4% energy savings over “standard motors.

Variable speed drives can reduce fan and pump motor energy usage by 50 % or more.



Energy Management System (EMS)

Depending on application and building type, the largest area of energy consumption in County facilities lies in Heating, Ventilating, and Air-Conditioning (HVAC) operations. To control this energy use, the Division of Operations undertook installation of energy management systems in all facilities. All HVAC systems are remotely monitored by computer dial-up on a daily basis. A significant additional benefit of the energy management and control systems is improved temperature control in work spaces and faster response to temperature problems in monitored buildings. A retrofit program is now underway to go one step further and actually be able to control equipment operation in addition to just monitoring performance.

The chart below quantifies the net average energy savings for typical building components. The energy savings attributed to each component is the combination of two or three different technologies working together to achieve the desired result.

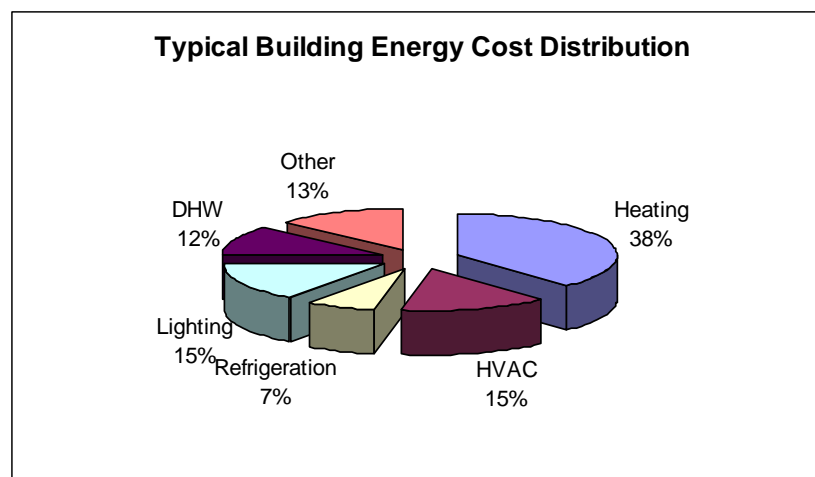


Table1: Typical energy cost distribution by selected building components.

In the figure above, the total energy savings from component individual contribution include reduced energy consumption by implementation of an energy efficient envelope.

Pumps and fans: Savings are derived from the use of energy efficient motors over conventional in conjunction with variable frequency drives wherever possible enabling pumps and fans to operate at their lowest speed to sustain air/fluid flow requirements resulting in 35-45% energy savings over constant volume machines.

Space Cooling and Heating: Savings are achieved through the careful selection of high efficiency and properly sized equipment and the use of heat recovery equipment when life cycle costs show that economic feasibility. Indoor swimming centers are a prime example. The waste heat from dehumidification equipment is utilized for heating pool water or reheat of indoor air to control humidity. The use of heat recovery air handlers are also extensively promoted to decrease the cost of tempering outside air during heating or cooling season.

Domestic Hot Water: The Division of Operations has been promoting the use of Natural Gas water heaters and boilers in lieu of electrically operated devices to further enhance savings. The chart below shows the relative cost for the same amount of energy using electricity or Natural Gas. On the average it would cost twice as much to heat a building with electricity in lieu of Natural Gas.

The Division of Operations also promotes the use of high efficiency boilers (90-95% efficient), over conventional boilers and furnaces (75-80% efficient) to promote even more savings.

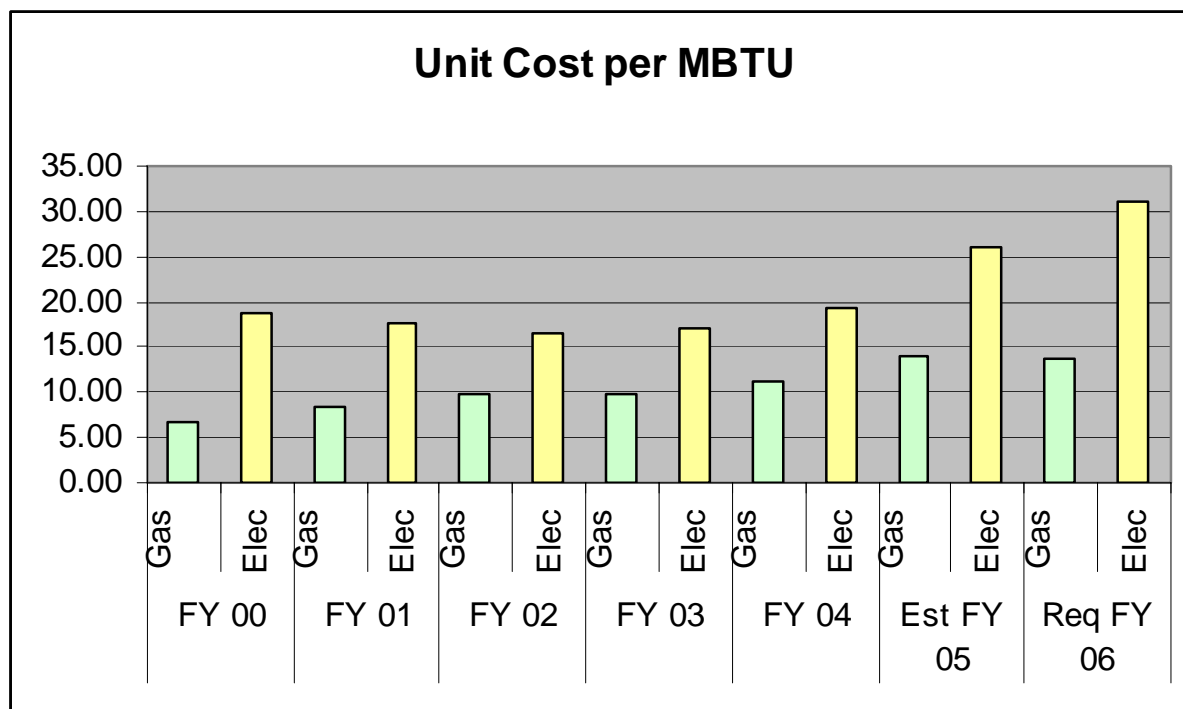


Table 2-: Electricity and Natural Gas cost for 1000 BTU units of Energy

The following are not included in the figure above but are worth mentioning:

Energy Source: The use of natural gas in lieu of all-electric provides a savings of approximately forty five cents for every dollar spent in electricity given that the cost of electricity is approximately twice as much as Natural gas, for the same unit (amount) of energy. (see Table 2)

Deregulation: The new electricity supply contract has resulted in an estimated \$3.9 M savings in electricity contract procurement through May 2003, an additional \$1.6M by renewing the existing contract through May 2004 and as of this date an additional \$1.5M through December 2005.

EMS: Energy management systems can reduce operating cost as much as 25% by providing remote monitoring and *control* of HVAC and lighting systems.



Building Envelope

In the past, more special considerations were given to high performance glass or high efficiency insulation that could enhance the performance of HVAC equipment. All new designs are required to use double pane energy efficient glass and low “E” coatings where analysis shows that there is an economic benefit. Each building is evaluated separately through life cycle analysis to determine if the predicted savings occur at an acceptable break even point. The use of this technology enhances the performance of HVAC equipment. Low “E” type windows can achieve 25% energy savings over conventional single pane type. Day-lighting techniques whenever feasible can provide an additional 5-10% additional savings

Envelope and EMS: Although not mentioned in Table 2 as an energy savings contributor, envelope and EMS enable all other components to operate even more efficiently. Just like energy efficient motors and variable frequency drives are able to provide minimum air/water flows when coupled to fans and pumps as compared to constant flow counterparts, the use of Building envelope also plays a very important role. The use of insulating materials and energy efficient windows can decrease cooling/heating requirement and reduce equipment size, first and operating cost as much as 25 %. The Energy management system is also responsible for across the board operating cost savings by enabling remote monitoring and operation of all building HVAC components and lighting which may now be programmed to be used only when needed.



Energy Star Buildings

Reducing energy use in buildings also directly reduces atmospheric pollution and greenhouse gasses from power plants. Recognizing this link, the US EPA recently started promoting systematic efficiency improvements to facilities as a major environmental initiative. Energy Star Buildings is both a program of technical guidance and a recognition label for efficient buildings. To earn the Energy Star label, a facility must perform better than 75 percent of similar facilities nationwide in energy efficiency.

At the Division of Operations the Energy Star survey process is integrated into a larger program of facility assessments. The assessments identify tasks that may be assigned to various Division of Operations sections and programs for action. Projects that require capital improvements to the facility, have an acceptable payback period through energy savings, and are not covered under other programs, will be assigned to the Energy Conservation CIP.

The Division of Operations showed its commitment to energy efficiency by hosting on August 20, 2004, an ENERGY STAR Conference. Attendees included energy managers and design professionals from Fairfax and Arlington Counties. Several topics were presented including Local Government perspective on “Green Building” design and energy efficiency considerations to be observed during the LEED process. In addition, building “benchmarking” was explained in detail in an “on hands” training environment.

IV. Utility Budget

A. Overview

County facilities can be categorized as Government Service Centers, the Executive Office Building and Judicial Center, Libraries, Police Stations, Parking Lots, Detention Centers, Transmitter Sites, Community Health Centers, Day Care Centers, Halfway Houses, Community Recreational and Swim Centers, and Supporting Maintenance Shops and warehouses. The ages of these facilities vary from new to over 100 years old. The hours of operation vary from about 60 hours a week to continuous 24-hour operation. The end uses of energy are primarily lighting, heating, air-conditioning, computers, and domestic hot water.

Table 3: Utility Budget

UTILITY TYPE	ACTUAL FY03	ACTUAL FY04	BUDGET FY05	ESTIMATED FY05	REQUESTED FY06	FY06 REQUEST / FY06 BUDGET
ELECTRICITY						
COST	\$4,165,960	\$5,190,679	\$5,462,700	\$6,996,421	\$8,853,490	162.07%
KWH's (000's)	71,685,123	79,243,142	0	82,161,826	90,408,821	
COST/KWH	0.0581	0.0655	0.0000	0.0852	0.0979	
\$						
Div. Credit	(73,254)					
WATER AND SEWER						
COST	\$622,832	\$694,845	\$736,180	\$737,358	\$799,941	108.66%
GALLONS (000's)	149,456	89,280	0	91,983	96,884	
COST/GALLON	4.1673	7.7827	0.0000	8.0162	8.2567	
FUEL OIL #2						
COST	\$76,396	\$72,269	\$85,180	\$89,021	\$80,515	94.52%
GALLONS (000's)	57,850	56,701	0	56,701	56,701	
COST/GALLON	1.3206	1.2746	0.0000	1.5700	1.4200	
NATURAL GAS						
COST	\$757,294	\$1,038,625	\$1,026,620	\$1,386,388	\$1,549,983	150.98%
THERMS (000's)	778,256	935,973	0	999,493	1,126,446	
COST/THERM	0.9731	1.1097	0.0000	1.3871	1.3760	
Prof. Services	\$146,866	195,062	200,000	200,000	200,000	
Charges fm SWS	\$0	170,410	225,010	225,010	225,010	
TOTAL COSTS	\$5,696,094	\$7,361,890	\$7,735,690	\$9,634,198	\$11,708,939	

The Utility budget also includes a premium for the purchase of Green energy. The upcoming electricity procurement effort will include 5% of the total use (kWh) to be "green energy." The energy type will be energy produced by wind mills located in the Western part of the State or West Virginia and will benefit the Counties air shed.

Net changes to electrical usage for new and leased facilities through next fiscal year are demonstrated in tables on subsequent pages for; "Projected Changes in Electrical Usage". This projection includes both increases in electrical costs to cover new and leased facilities. Reductions in costs resulting from current and future energy retrofit projects appear in the "new facilities" table. Additional information on new and leased facilities tables demonstrates "Projected Additions in Natural Gas Usage", and "Projected Additions in Water Usage".

Table 4: New Construction Projects - Projected Utility Usage in FY05 and FY06

New Construction Projects - Projected Utility Usage in FY05 and FY06

ELECTRICITY	Net Area	Energy Use	Occupied	FY05	FY06	FY 2005	FY 2006
	(Sq. Ft.)	(kWh/SqFt)	Year	PrRte factor	PrRte factor	Change (kWh)	Change (KWh)
Strathmore Concert Hall	194,500	11.00	FY05	7/12	12/12	1,248,042	2,139,500
Damascus Recreation Center	28,950	18.00	FY05	9/12	12/12	390,825	521,100
Germantown Library	44,000	17.00	FY06		6/12		374,000
Brookville Service Park 1	20,000	18.00	FY06		8/12		240,000
Rockville Library	85,975	15.00	FY06		5/12		537,344
Moneysworth Farm	2,000	18.00	FY06		2/12		6,000
AECC	10,700	34.20	FY05	10/12	12/12	304,950	365,940
Bethesda Garage #11	260,000	3.00	FY06		5/12		325,000
Multi-driver training	5,400	19.00	FY06		6/12		51,300
SubTotal	223,450					1,943,817	7,063,796
NATURAL GAS	Net Area	Therms/Ft2	Occupied	FY05	FY06	FY 2005	FY 2006
	(Sq. Ft.)	ESTIMATED	Year	PrRte factor	PrRte factor	New Usage (Therms)	New Usage (Therms)
Strathmore Concert Hall	194,500	0.26	FY05	7/12	12/12	29,386	50,376
Damascus Recreation Center	28,950	0.48	FY05	9/12	12/12	10,422	13,896
Germantown Library	44,000	0.46	FY06		6/12	0	10,120
Brookville Service Park 1	20,000	0.52	FY06		8/12	0	6,933
Rockville Library	85,975	0.45	FY06		5/12	0	16,120
Moneysworth Farm	2,000	0.50	FY06		2/12	0	167
AECC	10,700	0.00	FY05	10/12	12/12	0	0
Bethesda Garage #11	260,000	0.00	FY06		5/12	0	0
Multi-driver training	5,400	0.48	FY06		6/12	0	1,296
SubTotal	223,450					39,808	98,908
	Net Area	Gal/Ft2	Occupied	FY05	FY06	FY 2005	FY 2006
				PrRte	PrRte	New Usage	New Usage

WATER	(Sq. Ft.)	ESTIMATED	Year	factor	factor	(kGal)	(kGal)
Strathmore Concert Hall	194,500	13.00	FY05	7/12	12/12	1,475	2,529
Damascus Recreation Center	28,950	16.00	FY05	9/12	12/12	347	463
Germantown Library	44,000	10.27	FY06		6/12		226
Brookville Service Park 1	20,000	5.40	FY06		8/12		72
Rockville Library	85,975	12.50	FY06		5/12		448
Moneysworth Farm	2,000	15.00	FY06		2/12		5
AECC	10,700	30.00	FY05	10/12	12/12	268	321
Bethesda Garage #11	260,000		FY06		5/12		
Multi-driver training	5,400	15.00	FY06		6/12		41
SubTotal	223,450					2,090	4,104

New Leased Facilities- Projected Utility Usage in FY05 and FY06

	Net Area	Energy Use	Occupied	FY05	FY06	FY 2005	FY 2006
ELECTRICITY	(Sq. Ft.)	(kWh/Sq.Ft.)	Year	PrRte	PrRte	Change	Change
				factor	factor	(kWh)	(KWh)
DFRS Warehouse	33,800	14.00	FY05	12/12	12/12	473,200	473,200
Carroll House Shelter@W. Reed	7,500	28.00	FY05	12/12	12/12	210,000	210,000
Lincoln School	20,000	25.00	FY05	7/12	12/12	291,667	500,000
						0	
SubTotal	61,300					974,867	1,183,200

NATURAL GAS	Net Area	Therms/Ft2	Occupied	FY05	FY06	FY 2005	FY 2006
	(Sq. Ft.)	ESTIMATED	Year	PrRte	PrRte	Change	Change
				factor	factor	Therms	Therms
DFRS Warehouse	33,800	0.40	FY05	12/12	12/12	13,520	13,520
Carroll House Shelter@W. Reed	7,500	0.55	FY05	12/12	12/12	4,125	4,125
Lincoln School	20,000	0.52	FY05	7/12	12/12	6,067	10,400
0							0
Natural Gas Total	41,300					23,712	28,045

	Net Area	Gal/Ft2	Occupied	FY05	FY06	FY 2005	FY 2006
WATER	(Sq. Ft.)	ESTIMATED	Year	PrRte	PrRte	Change	Change
				factor	factor	(kGal)	(kGal)
DFRS Warehouse	33,800	5.00	FY05	12/12	12/12	169	169
Carroll House Shelter@W. Reed	7,500	25.00	FY05	12/12	12/12	188	188
Lincoln School	20,000	22.00	FY05	7/12	12/12	257	440
Water Total	41,300					613	797

FY 2006

Summary

The information on this page reflects the facilities owned or operated
by this agency as of the end of FY 04 (June 30, 2004)

Agency	MC Government DPWT Division of Operations				
Number of Facilities	177	Change in number of facilities	10		
Total square feet	3,386,112	Change in total ft ²	0		
Average operating hrs/year	Not available	Change in avg. operating hrs/year	Not available		
Other changes effecting energy consumption	Added ten 800 MHz Transmitter sites				
Utilities:	units	total consumption (actual FY 04)	Percent change from actual FY 03	total cost (actual FY 04) \$	Percent change from actual FY 03
Electricity	kWh	79,243,142	(+)6.54%	5,190,679	(+)10.20%
Natural Gas (firm)	therms	925,295	(+)13.75%	1,022,887	(+)13.54%
Natural Gas (Irate)	therms				
Fuel Oil #2	gallons	56,701	(TBD) %	72,269	(TBD) %
Propane	gallons	10,679	(+)34.52%	15,738	38.17%
Water/Sewer	gallons	89,280	(+)15.66%	894,845	15.64%
Total				6,996,418	

New Measures

This table shows information on resource conservation measures implemented during FY 05
(July 1, 2004 through June 30, 2005)

Measures - New: (Implemented during FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$) *
Capital Improvement Projects:						
HVAC/Elec. Replacement	FY 05	820,000		Elec.	100,000	6,000
Energy Conservation	FY 05	225,000	(15,000)	kWh	835,000	65,000
Total						71,000
Operations and Maintenance:						
Total						
Description of Activities:						

*Savings based on reduced energy consumption and reduced maintenance

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 05

Measures - Existing: (implemented from FY 99 to FY 05) (<i>Excluding FY05</i>)	date implemented (mo/yr)	initial cost per year (\$000)	annual net impact on maintenance cost (\$)	fuel type(s) effected and units	units saved per year	annual cost savings (\$) * *
Capital Improvement Projects:						
Elevator Modernization	FY 02	1.326	(2,000)	kWh	30,000	8,000
Elevator Modernization	FY 03	937	(6,000)	kWh	30,000	10,000
Elevator Modernization	FY 04	365	(6,000)	kWh	30,000	8,000
HVAC/Elec. Repl.:MCG	FY00	1518	-	kWh	2,550,400	306,048
HVAC/Elec. Repl.:MCG	FY01	1029	-	kWh	1,728,833	207,460
HVAC/Elec. Repl.:MCG	FY02	1819	-	kWh	3,056,117	366,734
HVAC/Elec. Repl.:MCG	FY02	1500	-	kWh	2,520,158	302,419
HVAC/Elec. Repl.:MCG	FY04	800	-	kWh	1,344,083	161,290
Energy Conservation	FY98	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY99	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY00	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY01	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY02	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY03	225	(15,000)	kWh	835,000	65,000
Energy Conservation	FY04	225	(15,000)	kWh	835,000	65,000
Life Safety Systems: MCG	FY01	225	(10,000)	N/A		10,000
Life Safety Systems: MCG	FY02	225	(10,000)	N/A		15,000
Life Safety Systems: MCG	FY03	225	(15,000)	N/A		15,000
Life Safety Systems: MCG	FY04	225	(15,000)	N/A		10,000
Lighting- ECC	Jan-98	\$9.583	(\$377)	Electricity	44,497	\$3,115
Lighting Upcounty Government Center	Jan-98	\$75.014	(\$2,948)	Electricity	348,302	\$24,381
Lighting- Poolsville Library	Jan-98	\$3.870	(\$152)	Electricity	17,969	\$1,258
Lighting- Second Genesis	Jan-98	\$16.345	(\$642)	Electricity	75,892	\$5,312
Lighting- Karma House Boys Academy	Jan-98	\$3.814	(\$150)	Electricity	17,710	\$1,240
Lighting- Rehabilitation Center	Jan-98	\$5.562	(\$219)	Electricity	25,827	\$1,808
Lighting- East Gude Men's Center	Jan-98	\$6.179	(\$243)	Electricity	28,691	\$2,008
Lighting- East Gude Conservation Corp	Jan-98	\$1.589	(\$62)	Electricity	7,379	\$517
Lighting- Rockville Clinic	Jan-98	\$2.749	(\$108)	Electricity	12,766	\$894
Lighting- Police Community	Jan-98	\$12.635	(\$497)	Electricity	58,665	\$4,107

Lighting- Glenmont Elementary	Jan-98	\$22.250	(\$874	Electricity	103,310	\$7,232
Lighting- McDonald Knolls	Jan-98	\$26.462	(\$1,040	Electricity	122,865	\$8,601
Lighting- Lone Oak	Jan-98	\$7.946	(\$312	Electricity	36,896	\$2,583
Hungerford Office Building DDC	FY00	\$157.000		Electricity	205,107	\$12,450
Council Office Bld DDC	FY99	\$73.000			271,829	\$16,500
Gaithersburg Library DDC	FY99	\$122.000		Elec/Gas	144,152	\$8,750
Gaithersburg Maintenance Depot DDC	FY99	\$31.000			228,533	\$13,872
EOB - VFD Replacement (2AHUs)	FY 03	\$42.499	(\$ 1.500	Electricity	25,725	\$2,595
JC - VFD Replacement (4AHUs)	FY 03	\$24.540	(\$ 1.000	Electricity	18,988	\$2,677
Parking lots: install photo cells and time clocks for lighting control	FY 04	\$18.000	(\$2.000		15,840	\$ 2,950
Total		\$11,106,363			18,945,535	\$1,997,802
Operations and Maintenance:						
Total						
Description of Activities:						

* Savings based on reduced energy consumption and reduced maintenance

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 06 (July 1, 2005 through June 30, 2006)

Measures - Planned: (for FY05)	projected completion date (mo/yr)	projected initial cost (\$000)	projected annual net impact on maintenance cost (\$)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings (\$) *
Capital Improvement Projects:						
HVAC/Elec. Replacement	FY06	800		kWh	100,000	6,000
Energy Conservation	FY 06	225	(15,000)	kWh	835,000	65,000
Total						71,000
Operations and Maintenance:						
Total						
Description of Activities:						

* Savings based on reduced energy consumption and reduced maintenance